



This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

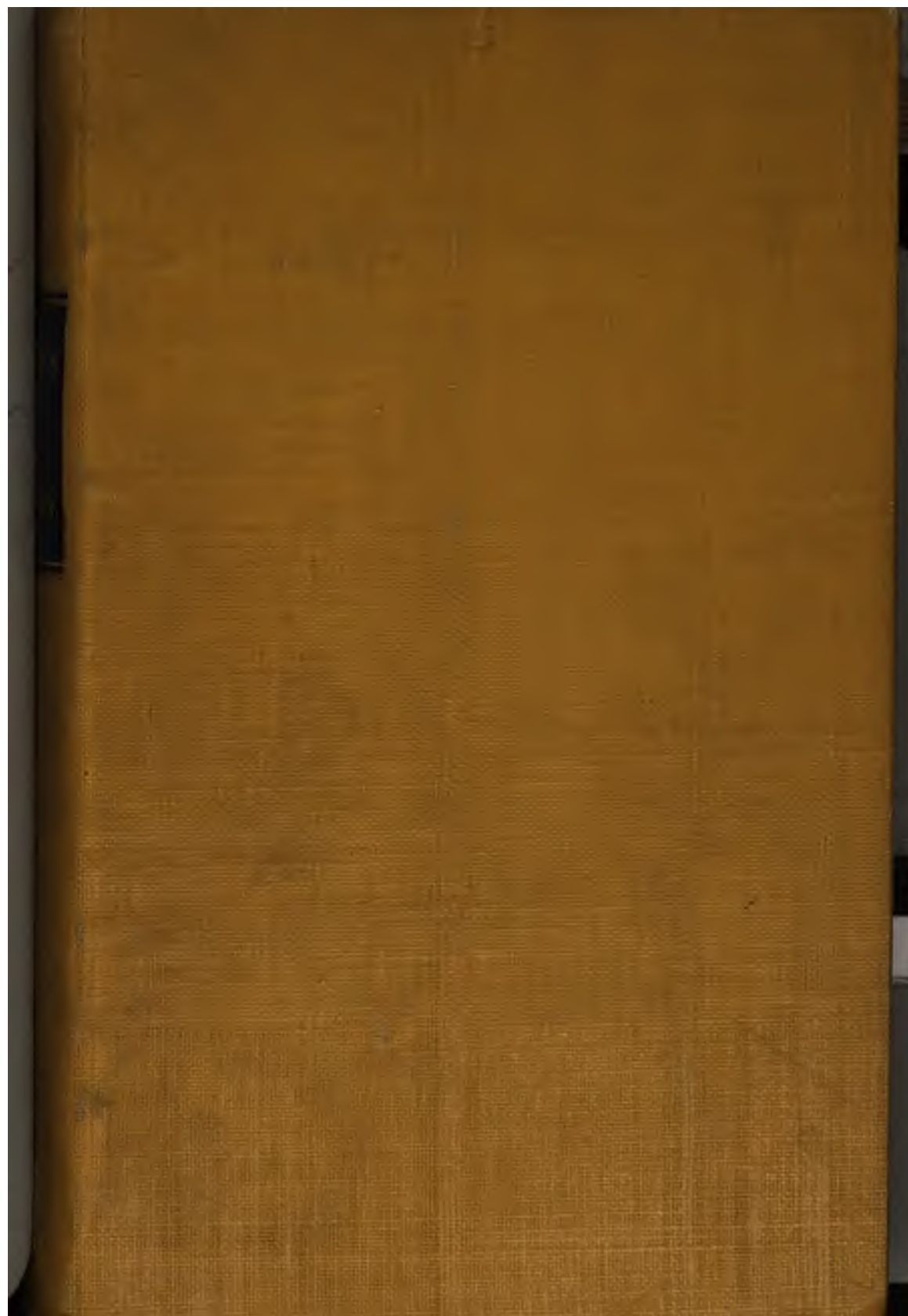
Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

- + *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
- + *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
- + *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
- + *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

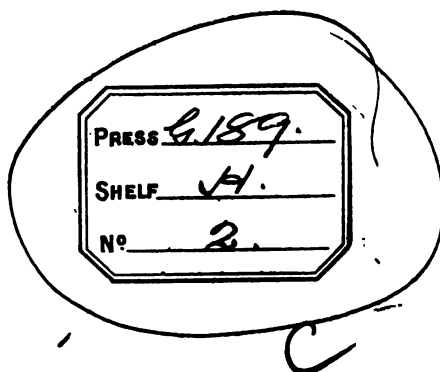
Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at <http://books.google.com/>



9



600031098R



PRESS 6.189.

SHELF H.

Nº 2.

1547 e. 40





RADCLIFFE SCIENCE LIBRARY

PARKS ROAD

OXFORD OX1 3QP





600031098R

PRESS	G.189.
SHELF	H.
Nº	2.

1547 e. 40

PRACTICAL ESSAY

ON

DISTORTION

OF THE

LEGS AND FEET OF CHILDREN, &c.

WITH AN

APPENDIX:

CONTAINING

**SIXTY-TWO CASES THAT HAVE BEEN SUCCESSFULLY TREATED
IN PATIENTS BETWEEN THE AGES OF ONE WEEK
AND TWENTY-FIVE YEARS.**

By T. SHELDRAKE.

LONDON:

**Published by the AUTHOR, at No. 10, Adam Street, Adelphi;
and sold by Messrs. DUFFIELD, Milsom Street, Bath, and
BULGIN, Corn Street, Bristol.**

1816.

20



Printed by Cox and Baylis,
Cambridge, (London: The Bodley Club).



PREFACE.

As the second edition of this work has been, for some time, out of print, and enquiries have been frequently made after it, I have reprinted it, as well as the Appendix, in its original form; because I am aware, that, notwithstanding they might be materially improved by recomposing the matters they contain in a more regular form, my avocations render it very improbable that I should have time and opportunity to give it that advantage; and I believe that those to whom it may be useful, would rather see it in its present state than not see it at all.

Thirty years have elapsed since I first directed my attention, seriously, to this subject; many of my professional friends thought lightly of my prudence, in undertaking it; and those who were not friendly, openly reprobated the undertaking, and used every means in their power to prevent patients from placing themselves under my care; that some of them succeeded, occasionally, I

of the parts, have not, by availing themselves of mechanical science, treated deformations of this and other kinds on philosophical principles, we are not enabled to say; but certain it is, that they are rarely undertaken by persons thus educated.

"The author of this Essay presents his plan of treatment fairly to the notice of the professional inquirer, and claims his regard on these grounds.

"Pref. p. ii.—"The situation," says he, "in which I was bred, having given me numerous opportunities of seeing these diseases, in all their varieties, and of seeing they were always treated in a way from which little benefit was derived, naturally directed my mind to the subject; and the nature of my professional education and pursuits, during the last twenty years, have enabled me to consider them in a way that had escaped the observation of others, and to make numerous experiments, in hopes of being able to cure them; I at last succeeded in some cases, in an eminent degree. An account of these cases was published several years ago; and the attention that publication excited, procured me numerous opportunities for pursuing my inquiries on this subject, the result of which will be found in the following pages."

"In a former work,* of which the present would seem to be a continuation, Mr. S. showed what had been done by other practitioners, with a view to remedy these deformities.

"Pref. p. iii.—The present essay "contains the history of some cases, which were placed, with unlimited confidence, under my care, and in which I was, *therefore*, perfectly successful. And, as I knew I must encounter the scoffs of incredulity, the doubts of scepticism, and the insinuations of those who might be en-

* See our Rev. vol. xxv. p. 34.

“ views of my success, I had the precaution to request,
 “ that they might be shewn to gentlemen in the profession
 “ of surgery, whose knowledge, judgment and integrity,
 “ were unquestionable, and who would, therefore, always
 “ ascertain whether what I attempted was rational, and
 “ what degree of success attended my efforts. The un-
 “ biassed opinions of these gentlemen are added to the
 “ history of each case, and will form a mass of incontro-
 “ vertible evidence to the truth of the facts.”

“ After describing fifteen cases, in many of which his
 method of management completely succeeded, he comes
 to the circumstances that render the club-foot curable, or
 otherwise. In considering this part of the subject, he
 finds it necessary to inquire into the anatomical structure
 of the parts concerned, and from the examination of the
 bones in these cases of disease, he attempts to prove,

“ P. 87.—“ That before the age of two years, the indi-
 “ vidual bones of a club-foot are not distorted in any
 “ manner; that as far as the bones are concerned in the
 “ disease, it is only by improper combination; that after
 “ the age of two years, individual bones become de-
 “ formed, according to circumstances, which vary in dif-
 “ ferent cases; but which do not, in all, render the dis-
 “ ease incurable. I shall now proceed to examine the
 “ condition of the ligaments, in various stages of the
 “ disease, in order to discover what alterations must be
 “ produced in them, in order to effect a cure.”

“ The ligaments and muscles are examined in the same
 way, and several practical deductions laid down. From
 the whole these conclusions are formed,

“ P. 135.—“ That three distinct operations are requisite
 “ to cure this deformity; first, to reduce the bones to
 “ their natural position and natural form, if the patient's
 “ age has occasioned any malformation to take place;
 “ secondly, to produce extension of any muscle that has

“ actually been contracted, or seems to be so from the
 “ position and consequent inactivity of the foot; and
 “ thirdly, to keep the foot bound in its natural position,
 “ till those muscles which have, from the circumstances
 “ of the disease, been weak and inactive, perfectly re-
 “ cover their tone and power, when, and when only, the
 “ cure will be complete.”

“ I may likewise be permitted to conclude, from what
 “ has been said, that every case of this disease may be
 “ perfectly cured, before the patient is three years old;
 “ that after that age, some may soon become incurable;
 “ but that others may remain in a condition to be cured,
 “ till the age of ten, eleven, or twelve years old, and
 “ even to a much later period of life.”

These observations being made on that species of club-foot that occurs before birth, the author comes next to those which happen afterwards. Here he also offers many remarks, and gives different practical directions. We have likewise some cases in illustration of the positions. In recent distortions of the knee-joints, Mr. S. tells us,

P. 174.—“ That two operations are requisite to effect
 “ a cure, viz. to replace the bones in their natural rela-
 “ tive position; and to retain them there, till the liga-
 “ ments and tendons connected with the knee-joint have
 “ recovered their natural power of supporting the weight
 “ of the body properly on the legs.

“ In recent cases, where the distortion has been brought
 “ on suddenly, or at least quickly, by debility, the
 “ reduction will be easily effected; for the same de-
 “ bilitated state of the parts that has occasioned them to
 “ give way, will not oppose any obstacle to any rational
 “ attempts to return the legs to their natural form, and
 “ then time, with the assistance of cold baths, &c. will
 “ enable them to recover, perfectly, their natural func-
 “ tions. But when, from length of time the disease

“ has existed, age of the patient, or any other circumstance, the parts have become rigid or contracted, it will require considerable caution to reduce them to their natural position ; but still it is possible to do so.

“ As the degree of relaxation requisite to produce this distortion is not great, so the degree of rigidity or contraction necessary to retain it in its worst form, is not greater than the relaxation which occasioned it. From this view of the subject, and from what we know of the effects of mechanical action upon tendinous contractions, it is not too much to conclude, there are few, if any cases, even in adults, that are absolutely incurable ; and from a knowledge that the mode of treatment I have invented may be adopted to every possible case, it would, perhaps, not be unwarrantable to conclude, that every case, which in its nature is not incurable, may be cured by it.

“ As the real value of every discovery or improvement is shown by the practical result, we have little hesitation in saying, that if Mr. S.’s method of managing the distortions he has here described be so completely successful as he assures us it is, it must be of much utility.”

A. R.

And the following character of the Appendix :

“ Mr. T. Sheldrake’s Cases of Distortion, whether successful or unsuccessful, are related with much perspicuity, candour, modesty, and apparent respect for truth. The importance of rendering distorted limbs serviceable to the unfortunate patient must be self-evident to the commonest observer. To parents who have the painful duty of supporting a deformed offspring, it must be consoling to see their children, through the means used by this ingenious artist, not only relieved from weakness and disease, but restored to health, vigour, and the natural beauty of the human figure, which has such an influence on society.

Nor can it be ungrateful to the general philanthropist to learn, that in the course of a few years, not less than sixty-two persons have been cured by the exertions of our author. The particular nature of these diseases and cures is exhibited by the plates, in outlines, drawn from models taken from the different limbs, both before and after the cures. Mr. T. Sheldrake has obtained a patent for the instruments which he uses in restoring distorted feet and legs to the natural position. When we consider that medical men in general have thought these things unworthy their attention, that very little science has yet been exercised in the construction of trusses and instruments for improving crooked limbs, and that they are generally made by mere mechanics, who have no anatomical knowledge, we can discover no reason why an ingenious and regularly educated gentleman, who may have made some useful discoveries in this neglected department of medical science, should not meet with every encouragement which circumstances may admit, or the nature of the subject deserve. This, however, to the prejudice of the public as well as the author, has not been the case; and he complains, with much apparent justice, of the improper conduct of his near relation, and also of a nominal editor of a medical journal. With these *personal* matters it is not our province to interfere, and if it were we should not decide, in such a striking case, on *ex-parte* evidence. We were rather surprised, indeed, to find that the author had been engaged in a controversy with one of his colleagues at the Westminster Hospital, a man of real talents, and formerly a very sanguine, now a very diffident practitioner, but still with a mind very superior to the other professor here alluded to. We acknowledge, however, both the justness and talents displayed in Mr. Sheldrake's remarks (p. 122-3) on that gentleman's letter. Upon the whole, we can only re-

commend this work to the attention of medical practitioners, and persons who may have friends or connections labouring under the infirmities which the author proposes to cure or remedy. We regret to state the fact, that there are more persons in England labouring under bodily deformity, than in most other countries of Europe; yet in no other can there be found better organized bodies in general."

Anti-Slavery Review.

CONTENTS OF THE ESSAY.

	Page
<i>Cases of Club Foot, &c.</i>	1
<i>Of the Circumstances which render the Club</i>	
<i>Foot curable, or otherwise</i>	52
<i>Of the Bones</i>	57
<i>Of the Ligaments and Muscles</i>	87
<i>Cases of Distortion of the Knee, &c.</i>	156
<i>Remarks on the preceding Cases.</i>	171
<i>Cases of Incurvation of Bones of the Leg.</i>	182
<i>Remarks on the preceding Cases.</i>	187
<i>Specification of the Patent</i>	195

PLATES OF THE ESSAY.

Plate	Page
I.	1
II.	4
III.	11
IV.	15
V.	17
VI.	22
VII.	26
VIII.	28
IX.	33
X. and XI.	71

SPECIFICATION.

I.	198
II.	203
III.	211

CONTENTS OF THE APPENDIX.

	Page
<i>Cases of Varus, &c.</i> .. .	2
<i>Observations on Cases of Varus, &c.</i>	55
<i>Cases of Valgus, and of Curvature in Bones of the Leg</i>	64
<i>Observations on Valgus and Curvature, &c.</i>	78
<i>Cases of Distortion from Contraction</i>	83
<i>Observations on Contraction, or Rigidity, &c.</i>	141

PLATES OF APPENDIX.

Plates	Page
1 and 2 to face.....	8
3 and 4	16
5	20
6	22
7	24
8	32
9	34
10 and 11	38
12 and 13	42
14	44
15	48
16	50
17	51
18	67
19	68
20	69
21	71
22	72
23	74
24	76
25	88
26 and 27	103
28, 29, and 30.....	130
31	134
32	136

Just published, price 6s. in boards,

A Treatise on Diseased Spine and on Distorted Spine, with Cases to illustrate the Success of a new Method of Cure.—By T. SHELDRAKE.

Likewise, a fourth Edition of

Useful Hints to those who are afflicted with Ruptures, on the Nature, Cure, and Consequences of the Disease, and on the Empirical Practices of the present Day, with an

Appendix,

Containing an Explanation of those Principles on which are constructed Trusses which have been invented and long used with Success by the Author in private Practice, and now first made public; likewise of several other useful Bandages which are now first offered to Notice.

Opinions upon the former Editions of this Work.

“ Every attempt, from a man of reputation, to establish rational principles of treating a disease that has been too much abandoned to the practice of quackery, must necessarily prove acceptable, and the title of the present work sufficiently explains its purport.”

Gentleman's Magazine.

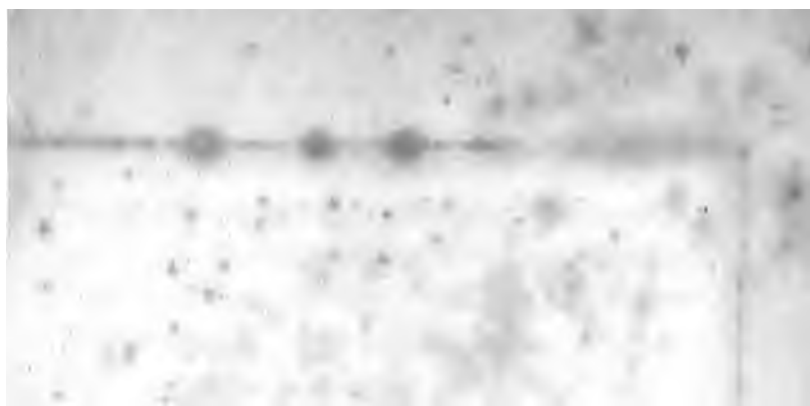
“ For the present work, the public is indebted to the author of a very useful work, entitled, ‘ A Practical

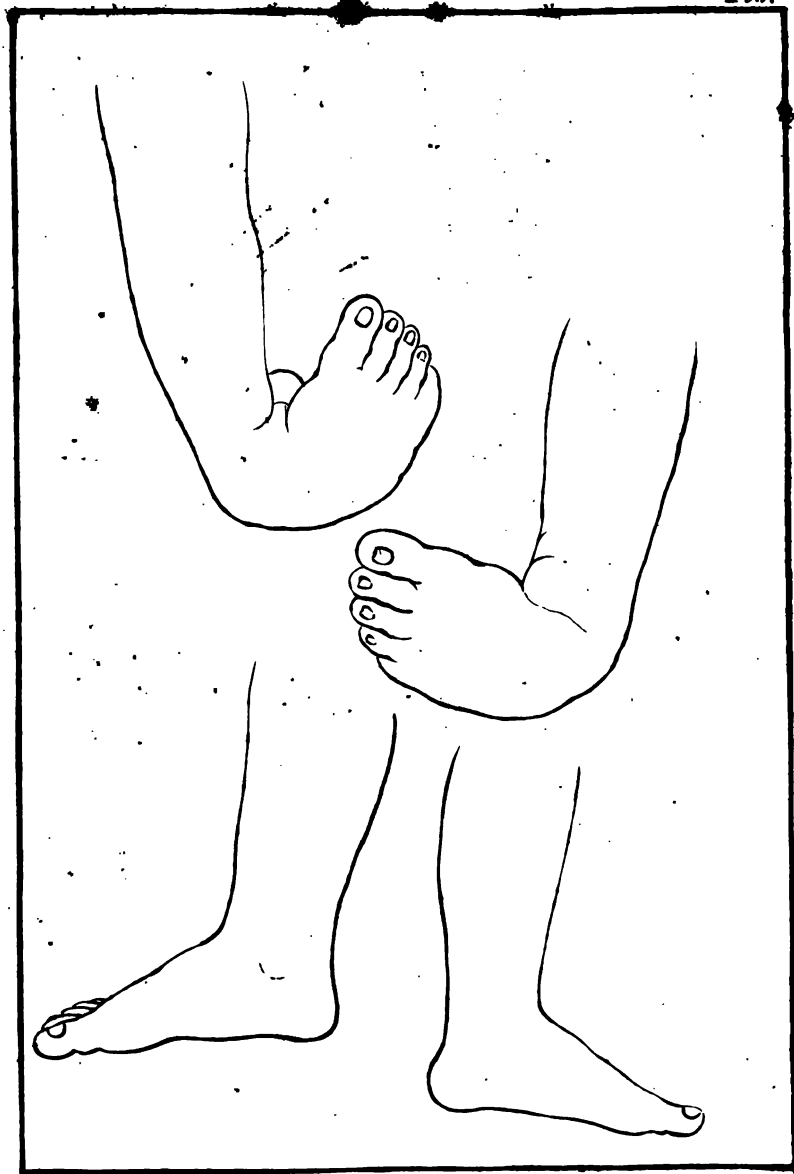
“ ‘ Essay on the Club Foot, and other Distortions of the
 “ ‘ Legs and Feet of Children,’ which has been well re-
 “ ceived, the present appears to us to be equally useful,
 “ and well deserving of the attention of those who are
 “ afflicted with ruptures, or have relations in that situa-
 “ tion.”

Tillock's Philosophical Magazine.

“ Mr. Sheldrake is a humourous author, and we have
 “ been more than once induced to smile at his quaint
 “ conceits and singular stories; he offers, however, some
 “ sound sensible advice, and we would recommend all
 “ those afflicted with this very distressing complaint to
 “ attend to his directions.”

Critical Review.





AN
E S S A Y
ON THE
CLUB-FOOT, &c.

C A S E I.

May 1st, 1796. A Son of — WELLS, No. 40, Monmouth Street, was born with two club-feet: the next day he was taken to the Westminster Dispensary in Gerrard Street, and, by Mr. FORD, recommended to me. The bones of the left leg were perfectly straight; the heel drawn upwards; the astragalus drawn inwards, so much that the inner angle could not be felt, and that part of it that should have been the outside of the foot was nearly at the bottom; the os cuboides was much distorted, with respect to the astragalus; and the metatarsal bones distorted in the same degree, with respect to the cuboides and cuneiform bones. The gastrocnemii and tibialis posterior were permanently contracted to such

B

a de-

a degree, that the foot was perfectly rigid. The right foot only differed from the left, by being something more flexible. The appearance of both is correctly represented in the annexed Plate, *Fig. 1. and 2.*

May 11th, I began my operations ; and proceeded uniformly and regularly, according to the principles I have elsewhere described, without any untoward circumstance, till July 8th, when I took off my bandages ; the feet were then as represented by *Fig. 3. and 4.* There was no appearance of the original malformation, nor any appearance of tendency to return to it ; I therefore considered the cure to be complete, and sent the patient to be examined by Mr. FORD, from whom I received the following note.

‘ Mr. FORD presents his compliments to
 ‘ Mr. SHELDRAKE, and has had great satisfaction in seeing the child of Mr.
 ‘ WELLS, who appears to him perfectly
 ‘ cured of the distortion of his feet.’

‘ Golden Square,
 ‘ July 12th, 1796.’

As

As this case was taken up so soon after the birth, and had been treated with complete success, in Mr. Ford's opinion as well as my own, it appeared a proper one to determine what danger there may be of a relapse, in such cases, after the feet are apparently cured. To ascertain this point, I directed that he should be brought to me in three months, after I had discharged him. It then appeared, that no permanent distortion had taken place; but, in consequence of the child's efforts to use his legs, from weakness in the capsular ligaments of the foot, and want of power in some of its muscles, there was a considerable tendency to the original distortion. I could, without difficulty, place the feet in their natural situation; but if left to themselves, the continual exertions of the child, in learning to walk, would, in time, have produced a permanent distortion, similar to the original deformity: I therefore took him again under my care, and at the end of two months, discharged him to appearance perfectly well; nor has he since had any relapse. At the time I am writing

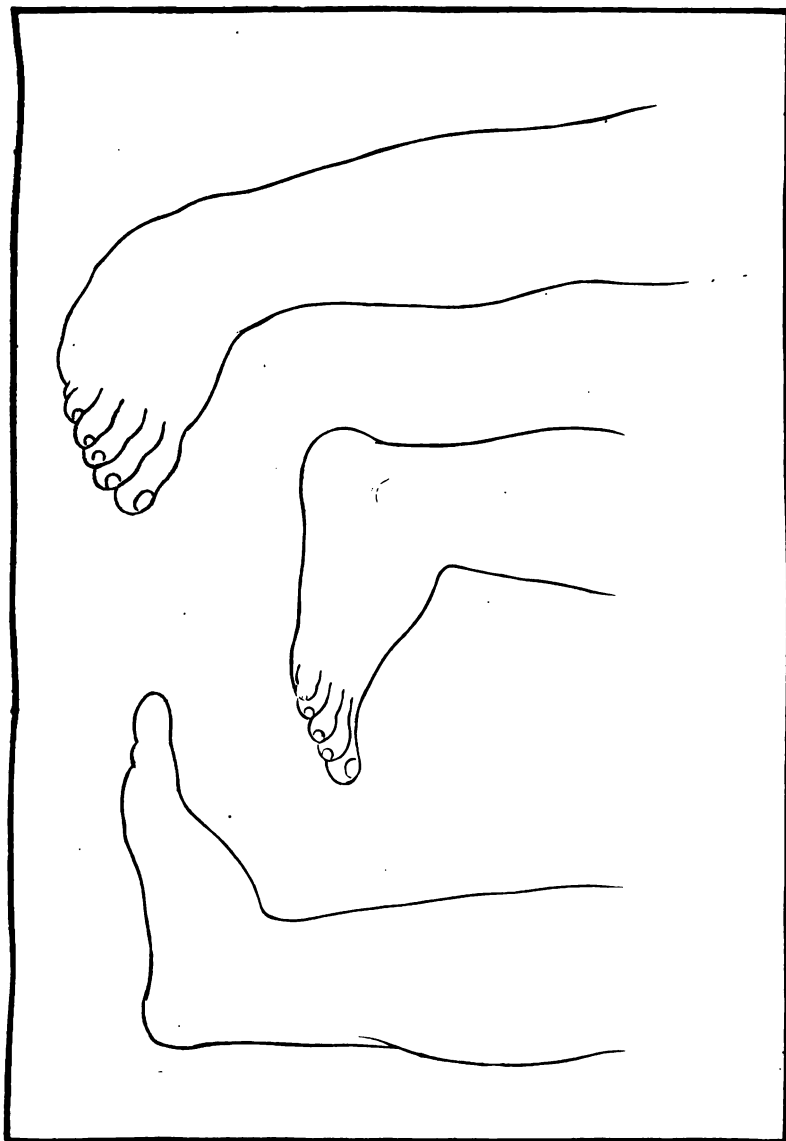
this, he is ten months old; he stands firmly on his feet; nor has he the least remains of, or tendency towards the original deformity.

In the general observations annexed to these cases, I shall endeavour to account for this tendency to relapse: *here* it may be proper to observe, that this case shews how necessary it is to attend closely, to prevent a relapse, almost till the patient can go alone, notwithstanding he is apparently cured as soon after the birth as is in the nature of things possible.

C A S E II.

In the summer of 1795, I was consulted by Mr. LYNCH, No. 55, Upper Dorset Street, Dublin, concerning his son, who was born with two club-feet, which, when examined, appeared to me capable of being cured.

Mr. L. had, previously, consulted several gentlemen in Dublin on the case; and, as no means of curing this disease was there known,





known, had been told it was incurable. As my opinion was so different from those he had already obtained, he, naturally enough, thought it necessary to proceed with caution, in placing the child under my care : from this motive, I suppose, he proposed that I should enter into a legal agreement to cure the child for a stipulated sum, subject to the opinion of a surgeon, to be named by himself; and if, at a future period, the child should relapse, to return the money paid me, if I failed to cure him a second time.

Such a proposal, on any other occasion, I should have rejected; but as I saw the motives which induced him to make, I resolved to accept it; though so much time was lost in the negotiation, that I would not engage in the cure during my stay in Ireland: I therefore agreed to his terms, provided the child was put under my care in London.

In December, 1795, he was brought to London. He was then more than twelve months

months old ; his feet were nearly alike, and were perfectly rigid ; one of them is exactly represented in the annexed *Pl. II.* My operations were immediately begun. The child's health soon began to decline, it was said, from change of climate : Mr. WILSON of Bedford Street was, on ~~that~~ account, desired to attend him ; and we were soon convinced, that his ill state of health was occasioned by every kind of misconduct in his nurse. To such a length was this carried, that none of Mr. W's directions were attended to ; and we saw him verging towards the grave, without a chance of rescuing him, unless he was previously placed with another nurse.

This no one was impowered to do ; and as much time was necessary to obtain such authority from his parents, it was agreed to suspend my operations till he could be removed, and his health be, in some degree, restored.

He had been so much reduced by ill treatment from his nurse, that it was the
end

end of March before he was sufficiently recovered for me to attend him. I then recommenced my operations, and every thing went on favourably, till his feet were perfectly reduced to their natural form. When I saw the measure was proper, I desired Mr. LYNCH to have the child examined, according to his own proposal. He, for that purpose, referred us to Mr. PEARSON of Golden Square, with whom I had, at that time, no personal acquaintance; and who, after examining the child, gave the following opinion.

‘ Golden Square, July 30th, 1796.

‘ I have examined the feet of Master
 ‘ WILLIAM LYNCH, this day, and have the
 ‘ satisfaction of attesting, that the deformity is so far removed, that the child
 ‘ walks evenly and firmly; nor should I
 ‘ have remarked any particular deviation
 ‘ from the natural appearance, if I had not
 ‘ previously known his situation.

‘ I am of opinion, that the child will
 ‘ enjoy the perfect use of his feet, and that
 ‘ no

‘ no appearance of the former curvature
 ‘ will remain, when the child has acquired
 ‘ more strength. Proper attention, for a
 ‘ certain time, will be absolutely necessary,
 ‘ in order to give security to the advantages
 ‘ he has gained.’

‘ JOHN PEARSON, *Surgeon.*’

It was with much satisfaction I received this opinion from Mr. PEARSON, as it exactly coincided with that which I had previously given of the case. I then desired Mr. LYNCH to determine whether he would take the child home, with such instructions as I thought necessary to give for his future safety ; or leave him in London, where he might be under my observation ; he very properly chose the latter.

I was then going a journey, which would prevent me from seeing him almost two months. The only circumstance that required attention was want of power in the peronei muscles, and which could only be obtained by keeping the feet bound, for a length of time, in a proper position, as will be more fully explained in my general observations,

observations. The means I use for this purpose are simple ; the nurse had continually seen me apply them ; she had been remarkably careful of the child, and was willing to do every thing in her power to serve him : this was, therefore, a fair opportunity to determine, how far it would be safe to leave a child, after his feet were reduced to the natural form, and before they had acquired their full strength, to the management of a person, unacquainted with the true state of the parts ; as the means to be used for keeping them well are so simple, that most people who see them applied are apt to suppose themselves able to do it effectually. I, therefore, after giving her every instruction that was possible, left him in her care, with as much confidence as the nature of the case would admit.

When I saw him, after my return, it was evident the feet were weaker, and farther from their natural state than they were three months before ; I therefore took him again under my care, and in

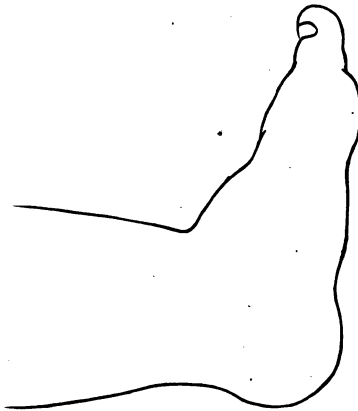
less than a month, again brought them in-
to the state described by Mr. PEARSON.
He continued mending ever since, till he
became perfectly well.

I have annexed a view, in its present
state, of that foot which had been previ-
ously drawn when deformed, and of the
cured one, and I have also annexed a view

The general circumstances of this case
will be accounted for in another place;
here, I would infer from it, the necessity
of attending to the feet of children, who
have not been cured at the earliest period
of life, *after they have been perfectly reduced to
their natural form, and until they can walk,*
in every respect, firmly, without any assist-
ance, or possibility of relapsing. I would,
likewise, infer, that there is little probabi-
lity, that this attention can be effectually
given by any, who are not professionally
and practically acquainted with the subject.
It will not, perhaps, be advancing too
much to say, that if this child had been
removed from my care soon after Mr.
PEARSON saw him, he would have relapsed
into



Pl. 3



into the same condition, however careful the nurse or parents might have been to prevent it; and that relapse would have been imputed to the imperfection of my method of cure; but as he is, it is a complete proof, that this deformity may be perfectly eradicated.

THE CHILD IS CONSIDERED IN VIEW OF A
 CASE III.

A DAUGHTER of Mrs. Jones, of Rush-
 Green, Lewisham, was born with one club-
 foot, and by Mr. Davies, Surgeon, at
 Lewisham, was referred to me.

November 8th, 1796, when she was a-
 bout two months old, this child was put un-
 der my care. The foot was, in some degree,
 flexible, and exactly resembled the annexed
 figure (Pl. III.) but the most remarkable cir-
 cumstance of this case was, the situation of
 the foot, with respect to the leg, as the astra-
 galus formed a most acute angle with the
 bones it was articulated with, in such a man-
 ner that if the child had then been placed on its feet,
 the end of the fibula would almost have

touch the ground. My usual method of treatment was pursued; but, from the inconvenience of bringing the child to me in town, it was almost three months before the foot was so far well, as to enable me to discontinue my attention.

Similar Case

As every circumstance of this case was favorable to the attempt, I resolved to ascertain, whether there was any danger of relapse, when these feet had been cured in early infancy, and left without bandages, before the child was of age to walk. When the foot seemed perfectly well, I took away all the bandages, and it appeared to retain its position, and all its powers, as well as the other foot; but at the end of a fortnight, it appeared to relax a little: I, therefore, applied bandages, to secure it in its proper position for another month: they were again removed, and it was more than a month, before any tendency to relaxation appeared. Bandages were again applied for two months, and removed a third time: the child was then able to stand, and walk imperfectly when held; she

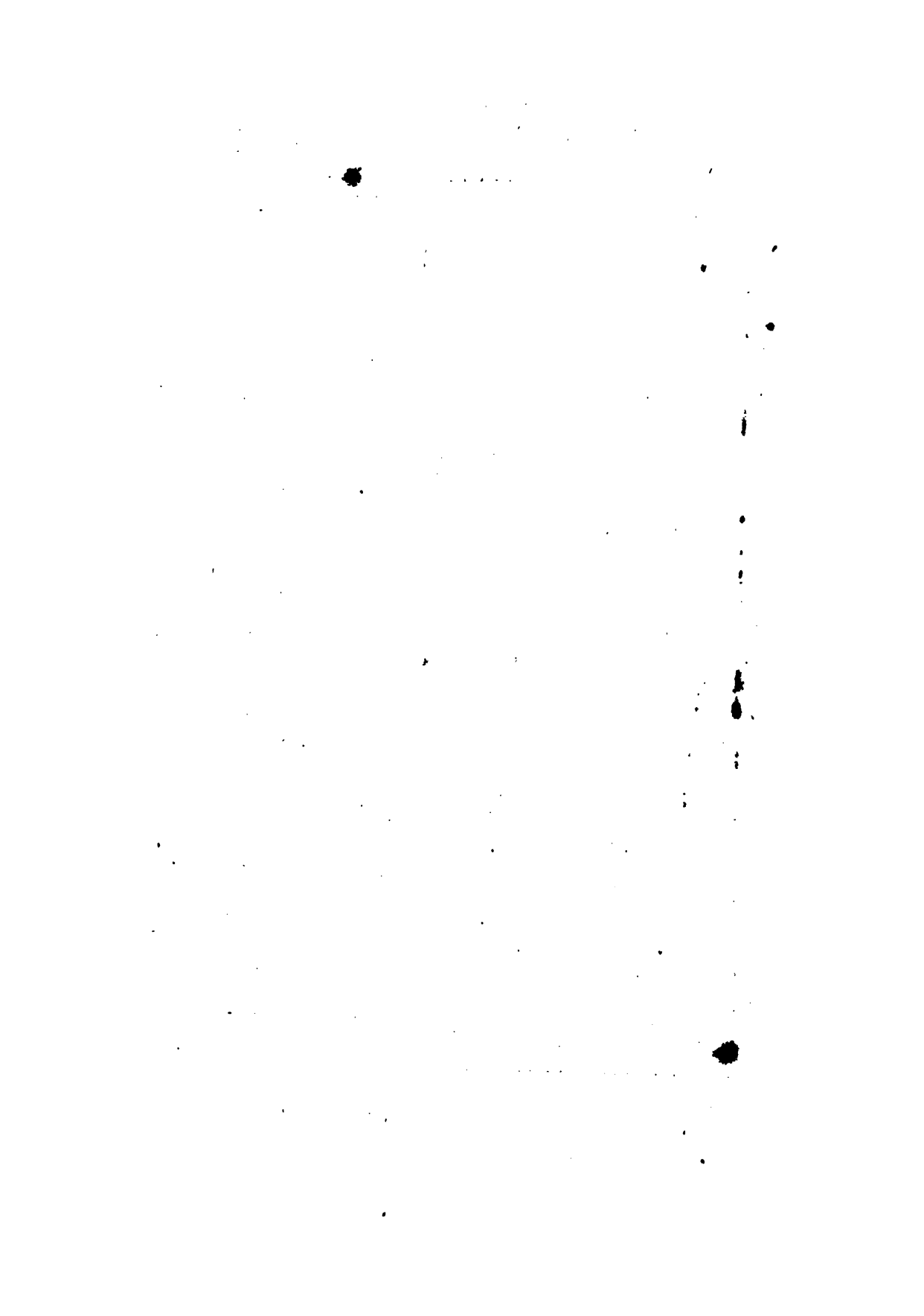
she stood as evenly and firmly on this, as on the other foot; but, after some time, when not standing, the foot seemed to tend a little towards its former position; I therefore finally determined to keep it properly bound, till the child walks alone, towards which period she is advancing, as fast as any child of her age can be expected to do.

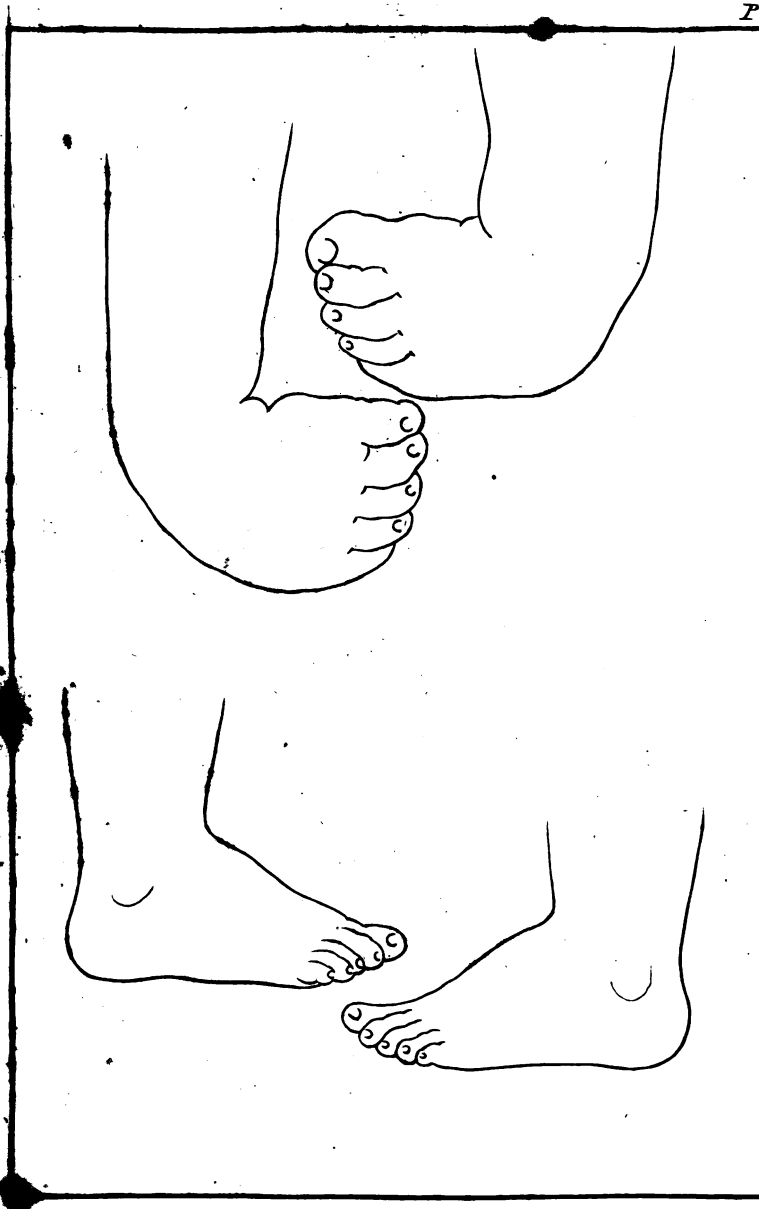
Cases like this, where only one foot was affected, are best calculated to prove what can be done towards a perfect cure; because the foot which has not been affected, and in the natural state, would be perfectly similar, will always afford, by comparison, a certain proof of the progress that has been made. This case seems to prove, that though such deformities may certainly be cured in a short time, during early infancy, it will often be necessary, and therefore always prudent, to keep such feet restrained to their natural position, till the patient is able to walk alone. From whence this tendency to relapse arrives, will be discussed in another place; I shall, therefore,

therefore, refer to the general observations on this deformity, for farther information on the subject.

As Mr. DAVIES saw this child occasionally during the progress of the cure, I have added his opinion on the subject. I have, likewise, given one view of the foot, before it was cured, and another representing its present state (*Pl. III.*)

The above case, so accurately described by Mr. SHELDRAKE, was one of the most complete of *club-foot* that ever came under my observation; the perfect cure of which must speak highly in favor of the mode of treatment made use of in remedying this dreadful deformity. The child, from being a cripple, now makes use of that foot, in every respect, as well as the other; and will, I doubt not, walk as free from lameness, as if it never had been affected. Having witnessed the whole progress of the cure, it is but justice to say, the means applied appear to me the best adapted, the most certain, and





• and expeditious in their effect; of any
• I have ever seen or heard of.

• M. DAVIES.

• Lewisham, 25th Oct. 1797.

• August 2d 1797.

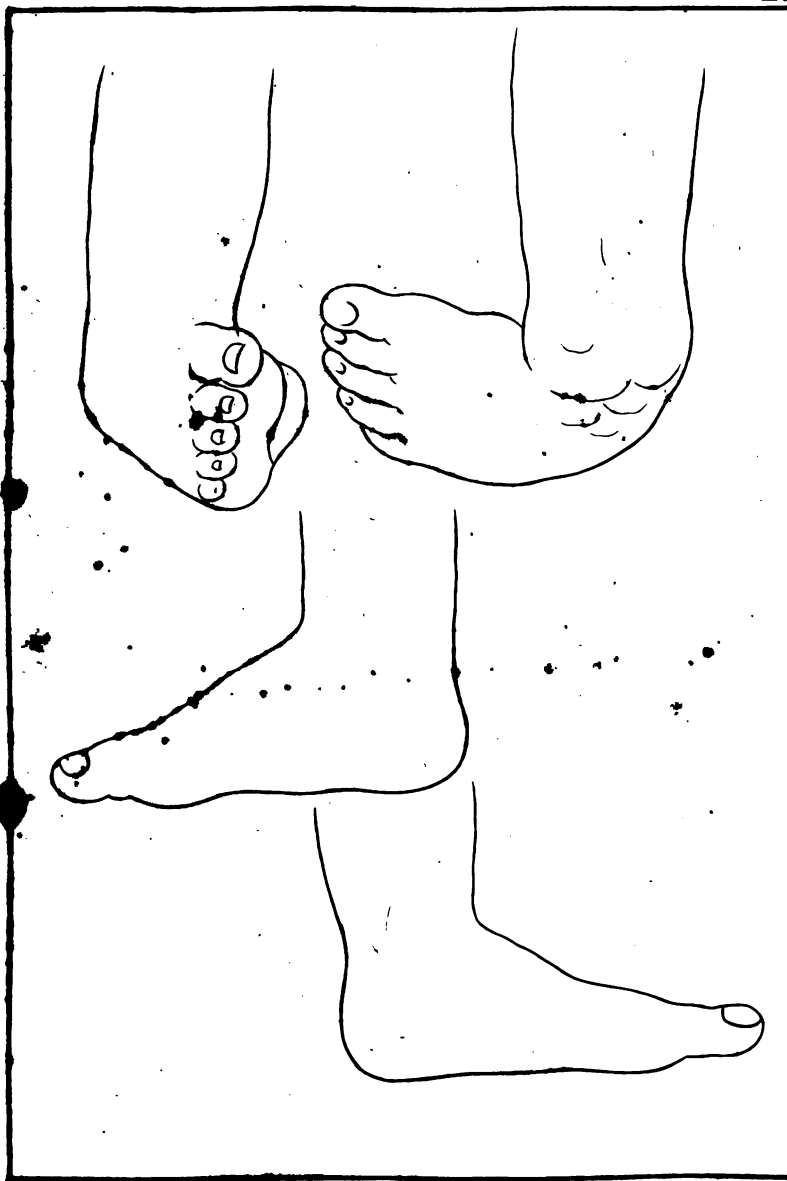
C A S E IV.

February 15th, 1797, Mr. PORTEA,
Surgeon, Tottenham-Court Road, desired
me to see the Daughter of a Gentleman in
his neighbourhood, who was born with
two club-feet. The child was a few days
old; (the appearance of both her feet is
correctly represented in the annexed Pl. IV.)
both were, in some degree, flexible, but
the right was the most rigid; the defor-
mity was principally confined to the bones
of the tarsus; the astragalus, particularly
of the right foot, formed a most acute an-
gle with the bones of the leg, inasmuch
that the cavity between them could be
completely felt on applying the finger; the
os cuboides, &c. likewise formed an acute
angle with the astragalus, and the cavity
between *them* was equally perceptible; but
there was little distortion in the toes. The
left

left foot was similar ; but not so much deformed as the right.

As there was no reason to doubt of success in this case, the child was fully confided to my care. As my usual method of treatment was followed, and no inconvenience occurred during the progress of the cure, it is only necessary to add, that in about two months, the feet were perfectly reduced to their natural form ; but as there was an evident necessity for continuing the use of bandages, they were applied for two months longer. At the end of this time, the feet seemed perfectly well ; the bandages were therefore discontinued. Soon afterwards, she was inoculated for the small pox, from which, in due time, she recovered ; but, in about two months, shewing occasional signs of weakness, it was determined to continue the bandages till she was able to walk alone.

I have added a representation of the feet, at the present time, and the opinion of Mr. PORTER, who saw the child, occasionally,



caſionally, during the time of my attendance.

‘ SIR,

‘ Having been witneſs to the cure, as
‘ above related, which you have given with
‘ correctneſs, I hold it incumbent on me,
‘ to acknowledge your ſuperior judgment
‘ in the management of deformity, ariſing
‘ from miſhapen bones. Indeed it would
‘ be injuſtice to your ſkill, did I not de-
‘ clare, I ſhall prefer your direction and
‘ mode of treatment, to any perſon I have,
‘ as yet, ſeen or heard of.

‘ I am, Sir,

‘ Your very humble ſervant,

‘ ROBERT PORTER.’

‘ Tottenham-Court

‘ Road.

C A S E V.

A GENTLEMAN in the county of Clare,
was deſirous of putting under my care, one
of his ſons, who was born with diſtorted

D

feet.

feet. From the account transmitted to me, I believed they were curable ; and, as insuperable obstacles prevented him from coming to London, it was at length agreed, that I should meet him in Dublin, stay with him a stipulated time, and then leave him, with such instructions as could be given for his future security.

In consequence of this determination, I first saw him, August 13th 1796. He was then about two years old ; a remarkably strong, healthy child ; and so active, it was with much difficulty he had been kept from walking till my arrival. His feet were so much turned in, that the soles lay completely against each other their whole length. If he had been permitted to go on his feet, in a short time, the external angles would have been on the ground, and the feet every way proportionably distorted. They were both very rigid ; but the right, both in point of form and rigidity, was much worse than its companion. The annexed figures, (*Pl. V.*) perfectly represent their appearance at this time.

I immediately began to reduce them, by the process I have already described in other cases; and proceeded so much more rapidly than I expected, that before the end of two months, the feet were perfectly reduced to their natural form. They were easily kept in that form, by the instruments I applied for that purpose; and in this condition he could walk about with much activity, either in the go-cart, or holding by the hand of an attendant; so that no doubt could be entertained, that he would recover the perfect use of his legs, if due care was taken to preserve him in the state I had now placed him.

I cannot sufficiently regret the circumstances that forced me to lose sight of this child, before he was placed beyond the possibility of relapsing towards his former state. But it was necessary I should return; he could not be sent with me; all that could therefore be done, after having placed him in a situation much better than his family expected to see him, was to give the best instructions that were practicable, to enable

his attendants to preserve the advantages that had been gained.

It must be remarked, that as the age of the patient, the degree of the deformity, and the limited time I was to stay, were all unfavourable circumstances. I was stimulated to make every exertion possible, consistently with those circumstances, to effect a cure: I therefore proceeded, as rapidly as I could with safety, to reduce the feet to their natural form; and had the satisfaction to succeed, without any inconvenience, in less than two months. But this proceeding left the feet peculiarly weak; the muscles had not gained their natural power; it therefore required particular attention to keep them in their proper position, till that strength was obtained. Having provided for this attention, as well as our relative situations would admit, I was permitted to take my leave.

Upon comparing this case with Master LYNCH's it will be evident, that the greater deformity, as well as more advanced age of
 5 the

the patient, were unfavourable circumstances; yet the event in each was the same: the feet were reduced to their natural form; nothing farther was necessary (to use Mr. PEARSON's expression) than certain attentions, to preserve the advantages that had been gained. Master LYNCH was permitted to remain under my observation, till those attentions were no longer necessary, and he became perfectly well, and had the complete use of his feet, in every respect: this child was removed from my observation; of course the subsequent attention was to be paid by those who had, no doubt, equal inclination to do him justice, but certainly not equal experience with myself. Could he have been permitted to remain with me, there is no doubt that the cure would have been perfectly complete; but, at present, I have no authority to say it is so. I have since been informed, he continues to walk with the instruments I supplied him with; but his feet are not so perfect in appearance as they were at the time I left him. The annexed (Pl. V.) represents the original state of
of

of the disease, and the appearance of his feet at the time I ceased to attend him.

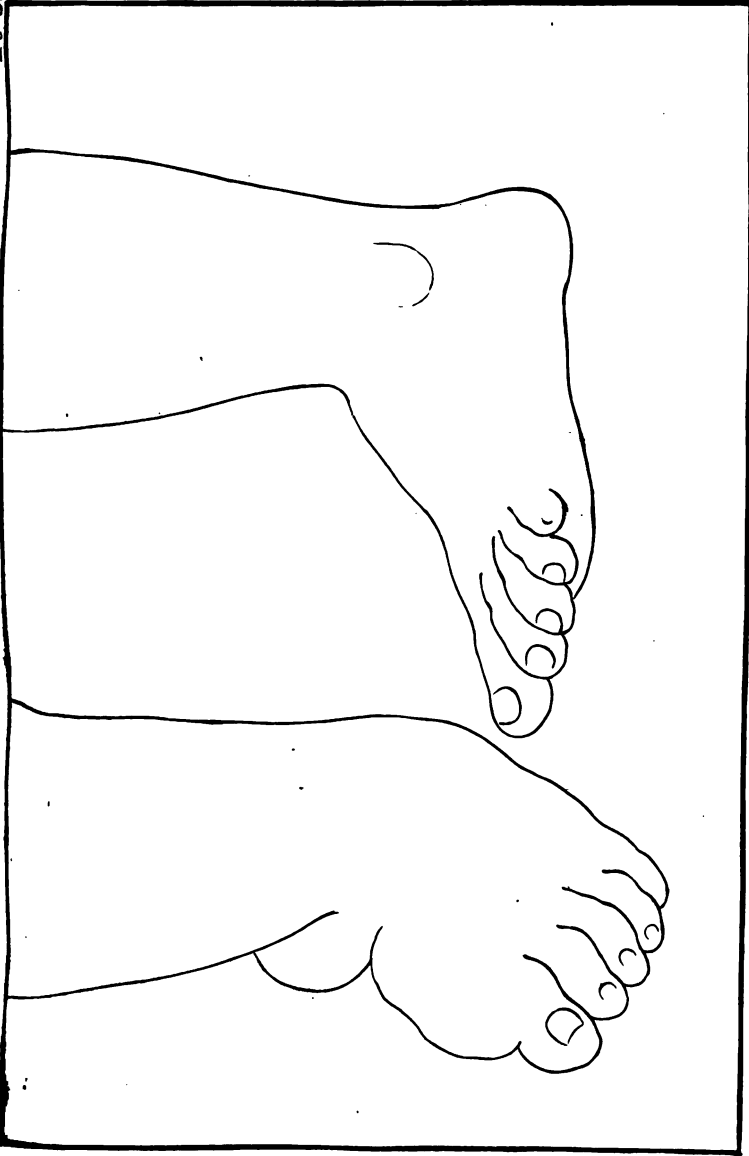
C A S E VI.

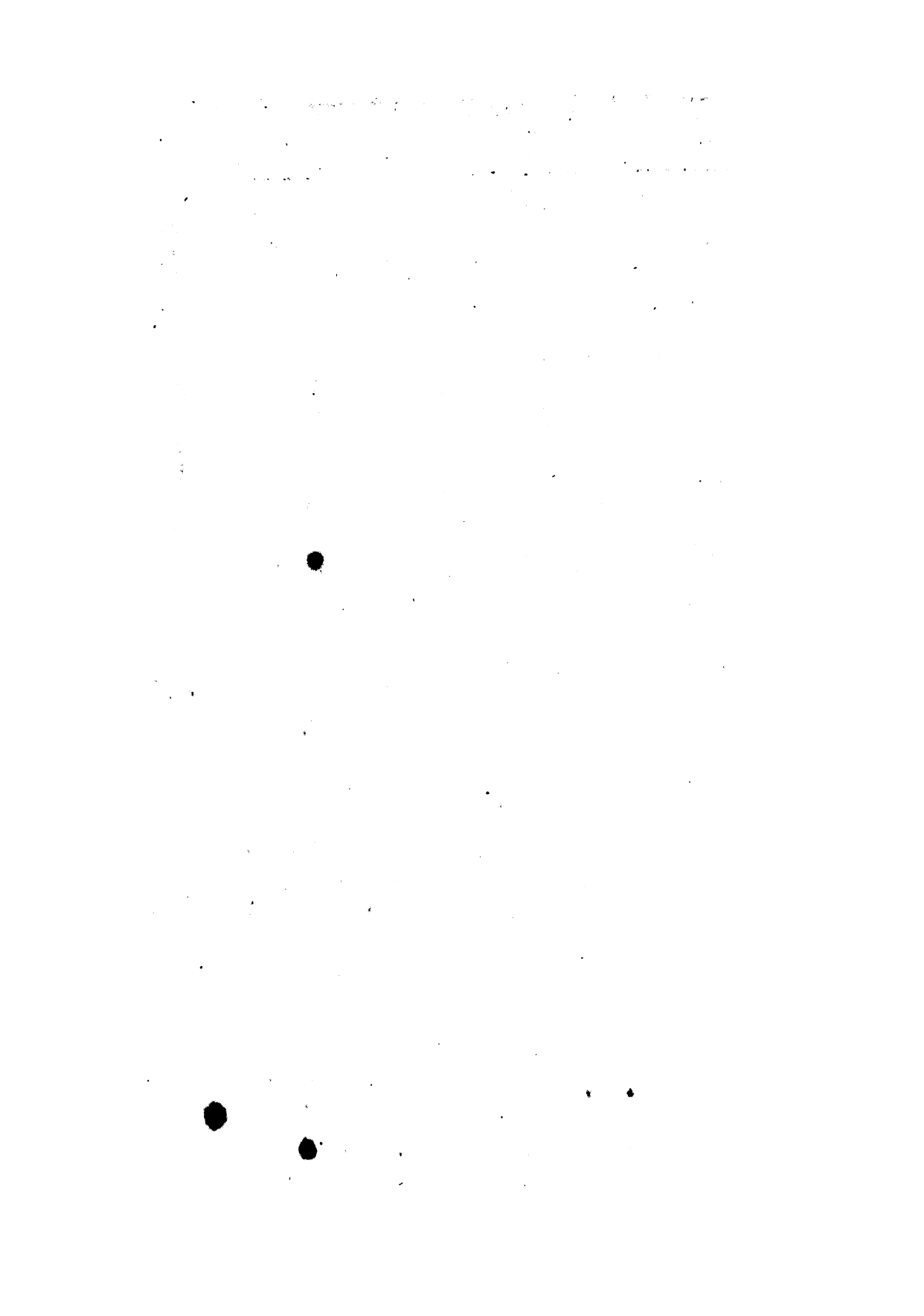
The Son of a Gentleman at Dunstable was born with one club-foot. A Surgeon in that neighbourhood directed such applications as are commonly made use of, but without the least success; whence it was presumed, the foot was incurable, and suffered to take its own course.

When he was about sixteen months old, his father consulted me. The child was to appearance healthy; and as the distortion had been thought irremediable, shoes had been put on, and he had been suffered to use his feet so much, that he was almost ready to go alone. As there was reason to believe him still curable, my opinion was given to that effect, and it was determined to put him under my care.

In consequence of his getting the small-pox,

FIG.





pox, with some unfavourable circumstances, he was not put under my care till April 2, 1796; at which time he was nineteen months old. Notwithstanding his age, notwithstanding the scrophulous disposition had shewn itself after the small-pox, in a way that induced me to think the necessary degree of pressure *might* produce disagreeable sores, the cure went rapidly on, without any unpleasant circumstance till May 25th, when his foot was reduced to the natural form.

As the parents seemed to feel all the inconveniencies of keeping this child long at such a distance from home, and were unwilling that I should attend him longer than was absolutely necessary, it was agreed, that so soon as the foot was reduced to its natural form, the child should be removed from my care, with proper bandages and instructions to keep it so; but when that was effected, they resolved to leave it under my observation, till it was perfectly well. To save the trouble of my attendance, the child was to be brought to me. The consequence was such as is always to be expected under these circumstances;

circumstances ; I had no controul over the nurse ; the parents were at a distance, and she brought the child whenever she thought proper ; which instead of once or twice a week, as I directed, was once in three or four weeks, and at others once in as many months ; in the intermediate time, she did with him as she thought proper. If any thing is to be thought surprizing in this case, it is, that any benefit could be derived from any mode of treatment so followed ; yet the foot continued to preserve its form, and the child obtained the use of it, though by no means so perfectly, and so soon, as if it had been properly taken care of.

When he was finally removed from my observation, the foot had perfectly regained its natural form ; he stood and walked as well upon that foot as on the other ; but when he was not standing upon it, there remained a little debility in the peroneus longus, which I have always seen removed by continuing the bandages. Directions were given to that effect, and the foot is now well.

• Every

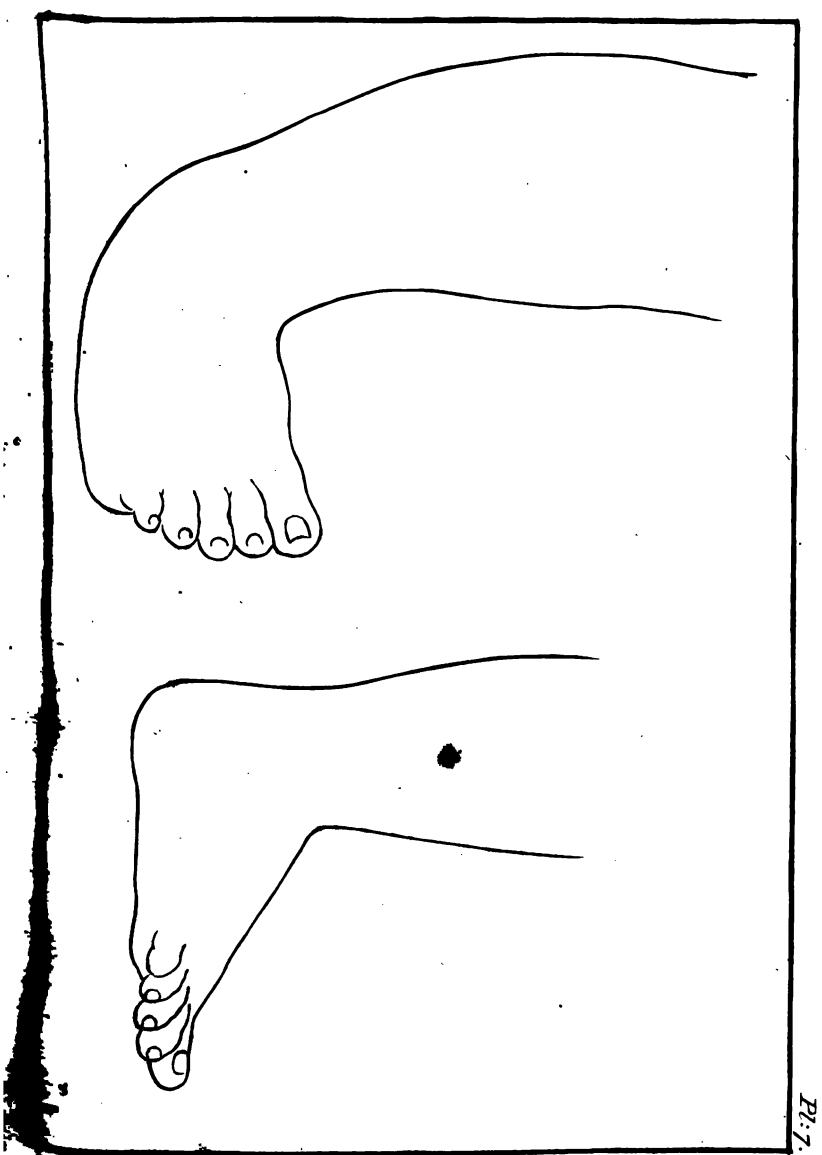
Every one who sees adults with club-feet, is sensible that the legs, as well as the feet, are less than the legs and the feet of people of equal size, who do not labour under that deformity ; and if a man has one club-foot, *that* leg is always smaller than the other : whence it has been argued, that this disease is originally a malformation of all the parts, and therefore, not to be remedied. This question will be fully examined in another place ; it is here to be observed, that this child was large of his age ; and as there was an evident difference in the size of his legs at the time he was put under my care, I ascertained, by measurement, that the distorted leg was half an inch less in circumference than its fellow. At the time I lost sight of him, they were exactly the same size.

I have annexed two views (*Pl. VI.*) of this leg, one in its original, the other in its improved state.

C A S E VII.

DURING my visit to Dublin, 1796, a Gentleman from Wexford put his son under my care. The child was above a month old, and had the right foot considerably distorted. The bones of the leg were strait; but the foot bent inwards, so that the superior part of the astragalus, which should have been joined with the leg, was perceptibly on the outside, and the whole foot was exactly as represented in the annexed Figure (*Pl.VII.*): it was perfectly rigid, and to appearance, incapable of any motion. As nothing particular occurred during the cure, it may be sufficient to add, that in something more than three weeks, the foot was reduced to its natural form; and when the child was removed from my care, I requested the parent to give his opinion of what had been done, which he did in the following terms:

‘ In consequence of my child having a
 ‘ turn in his foot, I came up to Dublin,
 ‘ from



Pl. 7.

‘ from Wexford, and applied to Mr. SHEL-
 ‘ DRAKE, the 7th of September, who under-
 ‘ took to cure it. I now certify, that in the
 ‘ course of twenty-three days, he made a *per-*
 ‘ *fect* cure of it. The annexed, No. 1, is the
 ‘ draft of the child’s foot when I applied to
 ‘ him, and now the foot is as the draft,
 ‘ No. 2. And, during the whole time it
 ‘ was under his care, I can testify, that the
 ‘ child was not in the least pain, nor never
 ‘ was disturbed more than if dressing or un-
 ‘ dressing.’

‘ Signed, &c.

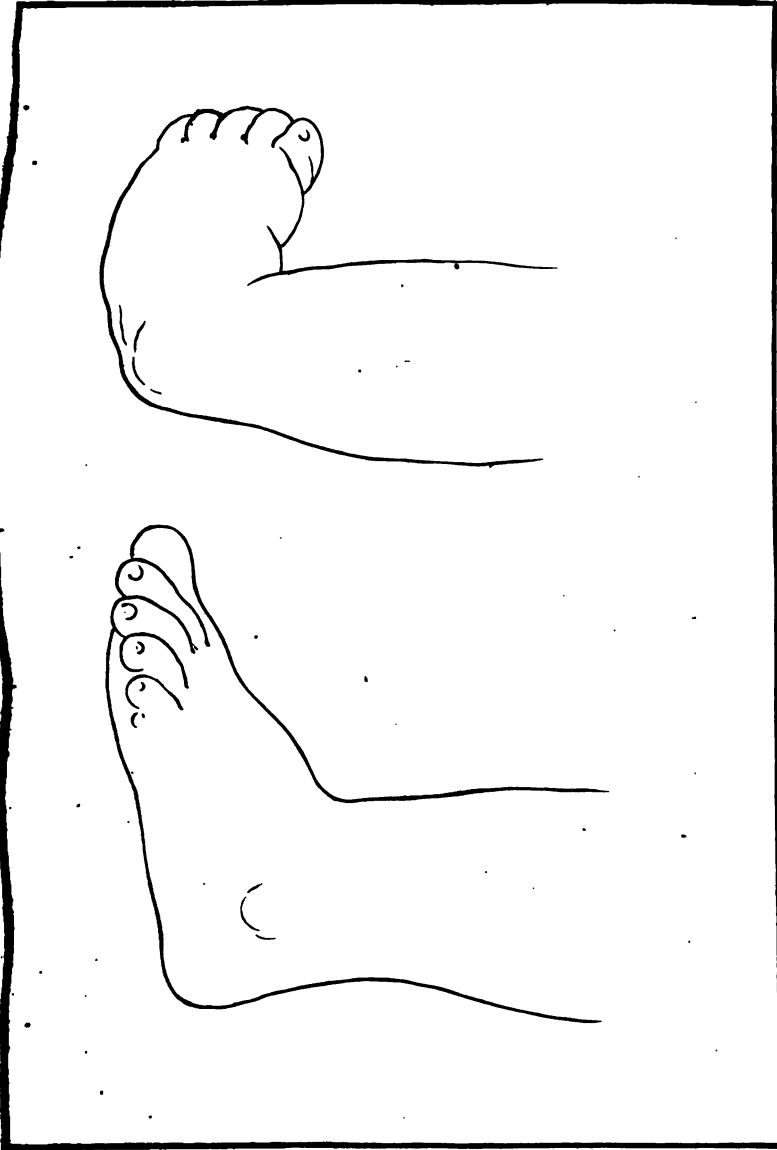
‘ Dublin,
 ‘ 30th September, 1795.’

It is incumbent on me to add, that when I ask any Gentleman for a written opinion on such an occasion, I wish it should convey his unbiaſſed ſenſe of the caſe. Such was my conduct on this occaſion ; but it is neceſſary to add, that the expreſſion, a *perfect cure*, muſt be underſtood to mean, that the foot was perfectly reduced to its natural form in that time. There was remaining that degree of debility in the muſcles, which always does remain,

and requires attention for some time afterwards to remove. As it was inconsistent with my situation, as well as his, that the child should remain *so* long under my care, it was agreed, that I should give bandages and instructions to keep the foot in order, till it was out of danger of a relapse. I did so, requesting that, if any untoward circumstance should happen, I might be informed of it, in order to remedy it if possible; but as I have never heard of it since, I have good reason to presume the child perfectly recovered.

C A S E VIII.

IN August, 1797, Mr. KENNY, Usher's Quay, Dublin, desired me to see one of his children. It was then three months old; and had been born with the left foot clubbed, as represented in the annexed (*Pl. VIII.*) It had been put to nurse in the country, and from neglect, reduced to the lowest state of existence: it was covered with a cutaneous eruption; and had many large sores in different parts of the body. Had such an object



ject been presented to me, in the ordinary course of business, I should have refused to do any thing with him, until his health was re-established; for, as there seemed to be little probability that he would live, it might, in case of death, have been said, by ignorant or malevolent people, that my operations had hastened, if not actually occasioned that event. But as my stay in Ireland was necessarily limited, and, in case his health was reinstated, there was no other chance of getting his foot cured, Mr. K. was very desirous I should make the attempt. As there were two large sores on that part of the leg my bandages were to be fixed on, I requested to know, from the Gentleman who attended the child, if he thought the necessary degree of pressure would be productive of bad consequences? to which I was answered in the negative. I then, from motives of personal safety, asked if the eruption I saw was not the itch? in answer to which I was told, Mr. — said it would come to be the itch, if not cured in time. These answers, and other circumstances, convinced me that caution, on every account, was necessary; I, there-

I, therefore, proposed that the child should be shewn, to ascertain its present condition, to any eminent surgeon in Dublin ; that it should then be put under my care, I engaging, during my stay, to reduce the foot to its natural form ; and when I had done so, the child was, upon my requisition, to be shewn to the Gentleman who had previously seen him, and upon his confirming my opinion, my attendance was to be at an end : but as I well knew there was danger of such a foot, under these circumstances, relapsing, I was to leave a proper bandage, with instructions necessary for his security. This plan was agreed on, and the necessary steps taken in consequence.

I immediately began my operations, having due regard to the feeble state of my patient. By the care and skill of Mr. —, he gradually recovered his health ; and, by the process I have already detailed in other cases, in about six weeks the foot was perfectly reduced to its natural form. I then requested, that the examination, previously agreed on, might be made ; but Mr. K. declared,

clared, *he* thought it unnecessary, as he was perfectly satisfied with *my opinion*. I continued to see the child, occasionally, for a fortnight longer, when I took off all my bandages, and made a drawing, to represent the *appearance of the foot at that time*. As I had not lately seen Mr. K., though frequently at his house, I wrote to inform him of my intended departure, and requested an interview, which he deferred to the last hour of my intended stay in Dublin; and then, to my great surprize, constituted himself judge of the case, declared he was afraid the child might *relapse*, and, in that case, he should send him to be under my care in London.

On my afterwards pressing him, by letter, on the subject, I received evasive and contradictory answers. 1st. Mr. K. said, the foot was not then well. 2d. The *nurse* said, the foot is growing better; and another boot, as he is pleased to call it, will compleat the cure. And at last, *five months after my leaving Dublin*, Mr. K's opinion was formally transmitted to me, stating, that he

7

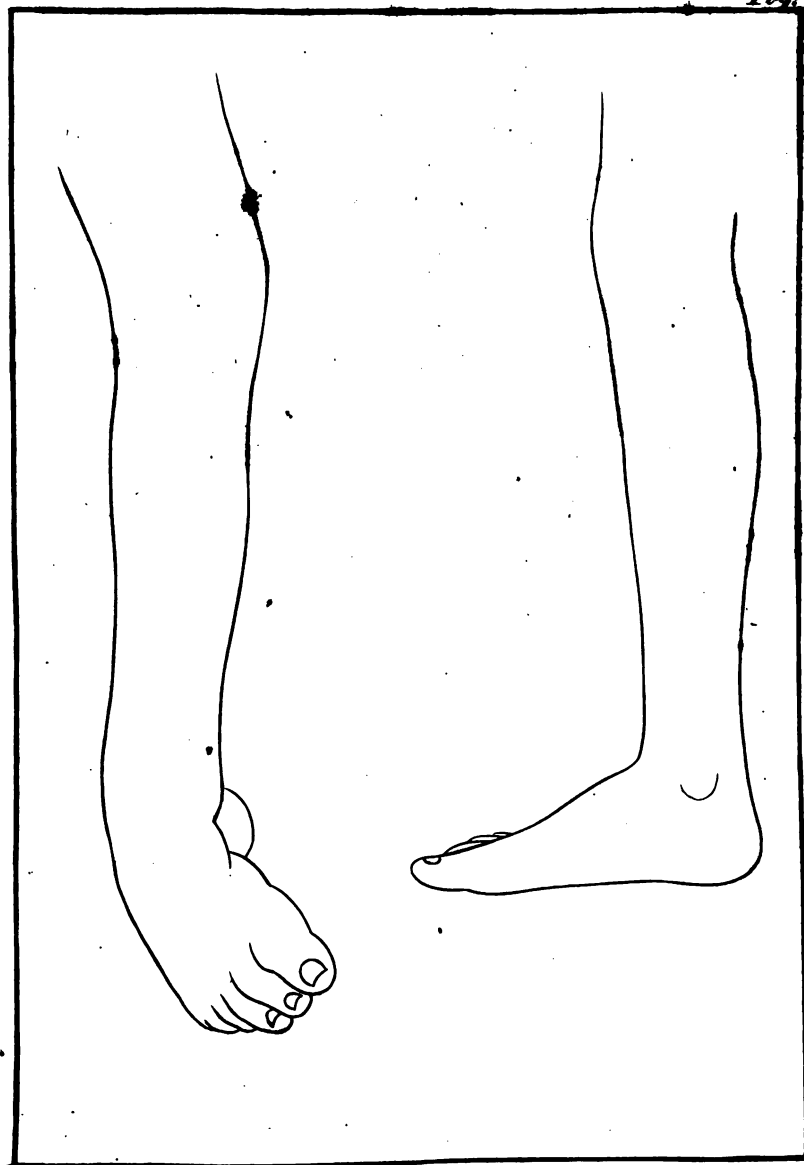
thought

thought the child's foot was not then well.

It will easily be seen, that I have no means of ascertaining the facts of this case (after I lost sight of it) in a satisfactory manner. It will therefore be sufficient to observe, that as it got well in as short a time as any other child of the same age has done, notwithstanding there were two running sores, each as large as a half-crown, immediately under the bandages, that those bandages produced no inconvenience to the child, and that those sores healed as soon as similar ones, in different parts of the body, in consequence of medicines given by the Gentleman who had the care of his health, it is to be considered as a strong proof, that the method I have invented for curing this deformity, may be practised with success, in many cases that are very unpromising to appearance.

As I have no positive information concerning the present state of this child, I have only to observe, that he has either got perfectly well,





well, by keeping the foot bound as I directed, or that, in consequence of neglecting that precaution, he has relapsed, in some degree, towards his former situation. If the wretched condition I first saw him in is considered, and if it is considered too that he was continued with the same nurse that brought him into that situation, his recovery might justly be called a miracle: but whoever reflects on the circumstances of Mr. K. evading the proposed examination, while I was present, and even not chusing to send me, in a satisfactory and regular manner, till after the expiration of five months, the opinion of the Gentleman who was to examine him, will conclude with me, that the child continued well for some time after my departure, and then, from mismanagement, or other causes, has perhaps deviated, in some degree, from that situation.

C A S E IX.

July 12, 1797, Mrs. PAWSEY, Maryle-bone Street, consulted me about her son, of whom she gave the following account.

F

count.

count. He was three years old, was born straight, and had been healthy, in every respect, till the age of fourteen months, when he had a severe fit of illness, and, in consequence, was so much debilitated, that he seemed to have lost the use of all his limbs. From this condition he recovered gradually, except that a small degree of weakness remained in his right foot: this increased, and the foot progressively turned inwards, till it became as represented in the annexed (*Pl. IX.*) She was advised to try the common leg-irons, which she procured to be made by a relation of mine. No benefit was derived from the use of them; and after repeated alterations, during eighteen months, he candidly acknowledged, he could not make them do better; and as no benefit had been derived from the use of these things, *he* knew of nothing else that could be of service to the child. She then consulted Mr. CRUIKSHANK, who recommended her to me.

At this time, the foot was not only distorted, as represented in the Plate, but
both

both the knees were bent inwards, in consequence of distortion in the foot. The foot, however, was the principal object of attention ; in something less than two months it was so far reduced to its natural state, that it could be placed in the natural position ; from which the second figure, in the annexed Plate, was drawn : the knees were likewise attended to, and, in five months, were perfectly restored to their natural state ; the foot, however, remains extremely weak, and must be so a long time before it recovers its natural powers. This is one of those cases which prove, that much deformity, and of the worst kind, may arise from circumstances apparently trivial. It proves too, that the application of the things commonly called leg-irons, is of no use in these cases, except to amuse the parents, by seeming to do something to relieve, while the disease may proceed, almost as rapidly as if left to itself : for there can be no doubt, that if a proper method had been adopted at first, the foot might have been cured in a few months, and the knees not have been distorted ; but, from the wretched management of this

F 2

case,

case, during so long a time, the foot was so much debilitated, that it will require the constant attention of a year or more, before it can be perfectly restored to its natural state.

C A S E X.

IN July, 1797, Mr. FARR, Surgeon, at Dunstable, in consequence of having seen the child of a Gentleman at that place, who had been under my care, (vide Case VI.) consulted me about a patient of his, who was in a similar situation; and, in consequence of my advice, he was brought to town, and put under my care. September 13th I first saw him: he was about seven months old; the left foot had been distorted before the birth, and no attempt had been made to relieve it. In appearance, and every other circumstance, it so exactly resembled the 7th Case in this work, that I thought it would be unnecessary to engrave my drawings of this.

The

The cure went rapidly on, and without the least untoward circumstance, till the 21st of October, when the foot was perfectly reduced to its natural form. I wished to have him longer within my observation ; but as it was inconvenient for the parents to be from home, they therefore determined to remove him, taking precautionary bandages, to prevent a relapse. These were to be applied, under the inspection of Mr. FARR, to whom I communicated the necessary information, and afterwards received the following opinion respecting the case.

‘ SIR,

‘ I hope you will have the goodness to
 ‘ excuse my not answering your letter soon-
 ‘ er, as I happened to be from home when
 ‘ Mrs. ——— called upon me, and their
 ‘ living some distance, prevented me from
 ‘ seeing the child so soon as I wished. I have
 ‘ carefully inspected the child’s foot, and
 ‘ am extremely happy in saying, that I
 ‘ think it a case that will do you great cre-
 ‘ dit, as I have not the least doubt, from the
 ‘ appearance of it, but the child will be
 ‘ perfectly

‘ perfectly free from any deformity. You
‘ may depend on my strictly attending to
‘ the directions laid down ; and shall, at all
‘ times, be happy in recommending you to
‘ any case that may fall under my care or
‘ knowledge.

‘ I am, Sir,

‘ Yours, &c.

‘ Dunstable,

‘ October 29th, 1797.

‘ CHARLES FARR.’

C A S E X I.

September 11, 1797, Mr. PORTER of Tottenham-Court-Road, sent me the child of a person in that neighbourhood, that had been born with one club-foot. It was about three weeks old at the time I saw him, and the foot, in its general appearance, resembled the last case.

The same method of treatment was pursued for about two months, when it appeared to be quite well ; but as the child was within my reach, I continued bandages on the foot for another month, when it appeared so well, that I hoped there could

be no farther occasion to make use of them.

In about a month, however, the foot seemed to relax towards its former position; I therefore again applied the necessary bandages, with a determination, that they should be continued till the time that the child will be able to walk.

The result of this case is an additional proof of the opinion I have always been disposed to entertain, that when the foot of a young child has been distorted in this manner, it should not be left at liberty, till it is able to walk ; as the inequality in the action of the muscles of the foot, will always give a strong tendency to resume the distorted form, unless prevented by proper bandages, till the child walks, when only, it may be said, to be secure from a relapse.

C A S E

C A S E XII.

In September, 1795, a Lady in Dublin consulted me, respecting her daughter, of whom she gave the following account.

She was then near three years old ; she was born with one club-foot, for which nothing had been done for some time ; but at length a Gentleman, who had acquired some vague notions of my method of treatment, undertook to cure it, but in the attempt he produced very high inflammation, swelling in the whole limb, and a considerable degree of fever, in consequence ; he was, therefore, obliged to desist, until those effects of his operations had ceased. His succeeding attempts produced the same bad consequence, during almost a year that they were continued. It was then proposed to cure the foot, by partially dividing the tibialis posticus and gastrocnemii muscles, to the contraction of which the distortion was attributed. So inconsistent is this idea, with the nature of the disease, and the proposed operation so little connected with rational

tional surgery, that I should deem it improper to be mentioned, if I had not known the same operation performed in another case, and, as it might be expected, without being productive of the least benefit. This operation was not submitted to, but another Gentleman was consulted, who, to complete the catalogue of absurdities, proposed to cure the foot by eroding the superior parts of it with caustic, which by contracting those parts, was to counteract the contraction of the gastrocnemii, &c. &c. and thus reduce the foot to its proper form!!!

Neither was this submitted to, or any thing else done, till I saw the child. Upon examination, the deformity appeared strictly confined to the foot; the connection of the astragalus, with the bones of the leg, was in its natural state; the bones of the tarsus were much distorted, particularly the os cuboides, which projected, apparently, much beyond the rest; the toes were much turned inwards; and she stood directly upon the outside edge of the foot. As she

G

could

instruments ; and after giving full directions for the use them, took my leave.

I have since been informed, by letter, that the distortion of the knees is perfectly removed ; and the foot so far recovered, that she has laid aside the instruments, and merely wears a stiff shoe, which keeps the foot in perfect good order.

C A S E XIII.

IN the Summer, 1794, a Gentleman in Dublin desired me to examine his son, then between three and four years old. He had been at nurse, in the country, with a woman, who strenuously denied all knowledge of any accident that could occasion the situation of his foot at that time, which she said became gradually distorted, and she was not able to ascertain when it began.

The right foot was bent upwards and outwards, so that, when he stood upon it,
the

the little toe could be brought nearly into contact with the fibula, and the end of the tibia almost touched the ground ; but when he did not stand upon it, it fell into its natural situation. The father assured me, that foot had been as perfect as the other, from the birth till the time he was put to nurse. The nurse asserted, he had never met with any accident, or complained of pain or uneasiness, which he certainly did not do at the time I saw him. It seemed as if the ligaments, which connected the bones of the foot, had been violently strained or lacerated on the inside, and the muscles connected with them, in consequence, had lost their power ; for he could not direct his foot into any particular position, when desired to do so. It is probable, that the cause of this, whatever it might be, was concealed intentionally ; and it was evident, that no rational attempt could be made, to do more than support the foot, in a position that would enable him to walk upon it, nearly in its natural situation, and, without straining it more, leave the rest to nature. This is what I undertook to do ; construct-
ed

ed an instrument for the purpose, gave proper directions for the use of it, particularly that it should be worn continually, and then took my leave.

In 1795, I saw him again. My directions had been implicitly followed ; and he had so far recovered the use of his foot, that, with a little attention, he could walk fairly and evenly upon it, and point the toe in any direction, when desired ; but when going carelessly, his ankle bent under him, as formerly, but not so much as at first. As so much good had been done by the plan he had followed, and no improvement in it could be suggested, I advised that it should be strictly persevered in.

In 1796, I again made enquiries after him, and was told by his father, that he was at a considerable distance in the country, that he had left off the instrument, and his foot was perfectly well. As the nurse's account of the beginning of this distortion is certainly not credible, I shall say nothing on that part of the subject ; but
as

as I have truly described the situation of this child, at the time I first saw him, as well as the subsequent alteration that took place, I may be permitted to offer such remarks as those circumstances suggest.

Were the capsular ligaments lacerated, or only violently strained? As it is difficult to conceive that a child's leg should be so injured, as to lacerate the capsular ligaments of the foot, without rendering surgical assistance indispensably necessary, which certainly was never obtained, it is not probable, the ligaments were lacerated in this case. But the child might get a violent strain, or similar accident, the nurse might conceal from the knowledge of the parents; and the child might be suffered to walk on his foot, already injured and neglected, till all the mischief took place that has already been described.

The fact I wish to impress on the Reader's mind, from the history of this case is, that extension of the ligaments, to as great a degree as can possibly take place in any club-

club-foot, may be remedied by the efforts of nature, assisted by keeping the foot judiciously bound, for a length of time, in a proper position, whence it is to be inferred, that no club-foot is to be considered as incurable, merely on account of such an extended state of the ligaments.

C A S E XIV.

I HAVE lately been consulted, concerning a young Lady, of whom the following account was given. She was born, in every respect, perfectly straight, and continued so till the age of five years, when she had a violent fever, and afterwards lost the use of all her limbs. From this state, she seemed to recover slowly, except the left foot, which continued weak, and had a tendency to turn inwards. Several gentlemen were consulted, who said it was only a little weakness, which in time would go off of itself: but it continued to increase; and it was at last determined to try a leg-iron, which was procured, and, as is too frequently the case on similar occasions, so
carelessly

carelessly applied, that if it was calculated to do any service, no benefit was obtained from the use of it. In this way she went on, from bad to worse, till the time I saw her, when she was sixteen years of age. The foot was as rigid, and as much deformed, as if it had been so from the birth. Considering the time this had been coming on, and the alteration that naturally takes place in all the bones of the foot, between the age of five and sixteen years, there was no reason to suppose it possible to cure, or even diminish the deformity in this case : I therefore contented myself with applying a leg-iron, constructed in the best manner, so as to support her, as effectually as possible, in her present situation. I have since seen her, and find her instrument applied in the same negligent manner as formerly, and the foot evidently worse than when I saw her first.

C A S E XV.

A SHORT time since, I was consulted by a Lady, who gave the following account of herself. She was twenty-three years of age, and five years ago, after a

H

severe

severe illness, she lost the use of one of her hands, and one foot. The hand afterwards recovered : the leg was wasted, flaccid, and, for a time, incapable of voluntary motion ; it slowly recovered, so far as to enable her to walk, with the assistance of crutches and a leg-iron, which she had very badly constructed at Bath ; but the foot turned inwards, and became, in every other respect, like the common club-foot.

As there remained much flexibility in the foot, and the distortion did not commence till after she was eighteen years of age, it did not appear to me, that such an alteration had taken place, in the state of the parts, during those five years, as to preclude the possibility of effecting a cure. I have not seen or heard of her since.

I have related the above cases as they were described to me ; because it is important, that such facts should be known, as, if they make a proper impression, they tend to preserve others from similar misfortunes. As the treatment of such cases has seldom been the object of surgical attention

tention, the extensive knowledge and influence of old women, &c. &c. has been allowed to operate in its full force, and undoubtedly been productive of much mischief. If any person of this description, has known one case of this kind, the history of which they really were acquainted with, they generally assume, that all others, similar in appearance, have arisen from the same cause. As many distorted feet certainly become so, previous to the birth, a prejudice has very generally been adopted, that it is impossible for such distortion to take place at any period afterwards. Many cases, within my knowledge, prove the reverse of this position; but I have selected the two already related, to shew the falsity of the notion, that a child who has only a little weakness in its ancles or knees, will get well, without assistance, as it grows up; a notion, the indulgence of which has occasioned the neglect of many a deformity that might have been cured in the beginning, and thus permitted it to become incurable, and made the sufferer a cripple for life.

OF THE

*Circumstances which render the Club-foot
curable, or otherwise.*

IN my observations on distortion of the legs of children, I endeavoured to establish the following facts ; *viz.*

1st. That species of club-foot, with which children are frequently born, may be perfectly cured, provided the cure is undertaken before the child begins to walk.

2d. It is not impossible, that many cases may be perfectly cured, if undertaken after the patient has walked : though this must depend upon circumstances, in particular cases, which cannot be foreseen, and therefore was not advanced as a general fact.

3d. If the cure is not attempted till the bones are completely ossified, it cannot be effected ; and, in many cases, the deformity cannot be alleviated, though the exertions

exertions of art may be necessary to prevent it from being increased.

Whoever has read the preceding cases, will, perhaps, be disposed to allow the facts above stated are now completely demonstrated; and, if they peruse the annexed specification of my patent, they will perhaps allow too, that the method I have invented is capable of curing every distortion it shall be skilfully adapted and applied to, provided there is no circumstance in the case which render it physically impossible that a cure should be effected. These points being settled, it only remains to enquire, what circumstances will, in any case, constitute an absolute and insurmountable impediment to the performance of a cure; and what circumstances will render a cure uncertain, or otherwise. When this has been done with tolerable accuracy, we cannot be much at a loss, to form a rational prognostic on the event of any case that may come under examination.

In order to do this, it will be necessary
to

to ascertain what is the difference, in point of form and powers, between the parts affected by the deformity, when in their natural and in their diseased state, and what are the progressive alterations which take place in those parts, during their removal from the natural state to that which constitutes the disease ; and, *vice versa*, in all the variety of circumstances in which it comes before us. And, as in most cases, this distortion takes place before the birth, and in many at a time remotely antecedent to that period, it will be necessary to begin our enquiries, at least as far back as it is presumed the disease originates. This retrospection, necessarily directs our enquiries to the formation of some parts of the foetus, though not of the foetus itself, and induces the necessity of mentioning some facts which are generally known, and which it would be otherwise unnecessary to mention here, but that it is proper to leave as few circumstances unnoticed, or to be taken for granted, as the nature of the subject will admit.

A respectable

A respectable * author has said, ' It is not easy to explain, in their natural order, the various parts of which the human body is composed; for they have that mutual dependence upon each other, that continual circle of action and re-action in their various functions, and that intricacy of connection, and close dependence, in respect of the individual parts, that, as in a circle, there is no point of preference, from which we should begin to trace its course, there is, in the human body no function so insulated from other functions, no part so independent of other parts, as to determine our choice. We cannot begin without hesitation, nor hope to proceed in any perfect course; yet, from whatever point we begin, we may so return to that point, as to represent truly this consent of functions, and connection of parts, by which it is composed into one perfect whole.'

The application of this opinion to the
objects

* Anatomy of the Bones, Muscles, &c. by JOHN BELL.

objects of this enquiry is so apposite, that it would be difficult to deviate from it, in any respect, without proportionably rendering those objects more obscure, instead of illustrating them ; I shall, therefore, I trust, be excused for making it the rule for my conduct, in prosecuting this enquiry.

Every one who sees a club-foot can tell it is a distortion, or at least a deviation from the natural state of the limb ; but the anatomist, who wishes to understand the disease, will endeavour to examine, separately, the state of the bones, the ligaments, and the muscles, and when he is acquainted with the particular state of all those parts, he will consider them as combined in one whole, and by this method, will be enabled to form a more correct idea of the disease, than by any other method he can pursue. I shall, for this reason, direct my inquiries, to the bones, the ligaments, and the muscles, in order, beginning with the first.

OF THE BONES.

WHENEVER I have been consulted on these distortions of the feet, I have found an idea generally prevail, that the disease is incurable; but after I have explained the reasons which induced me to form a different opinion, the probable rectitude of that opinion has been admitted, with this qualification, "*if taken in time; for while a child is young, the bones may be easily moulded to any shape we please.*" Now, though the bones of young children may easily be bent by disease, or by other causes, the conclusions drawn from that axiom, and applied to the deformity in question, must lead to false ideas of the disease; for, in the earliest periods of life, when the bones are softest, and of course easiest bent, they are not at all affected in feet that have this deformity, of course their pliability, real or supposed, is entirely out of the question: and, when the bones are really deformed, and the perfect cure, consequently, depends upon altering the form of those bones, they are so far advanced in hardness, as, in the common opinion, to be incurable. Thus a false

doctrine is built upon the misconception of facts, and the consequence will be, if those facts are not clearly understood, that the prevalence of the doctrine founded on them will occasion many cases to be neglected, till they are incurable; because it has been believed, they become incurable much sooner than they really are so.

Taking up this subject, as I did, when the disease was believed to be, in its nature, incurable, it became me to be peculiarly cautious of advancing more than I was prepared to prove: I therefore only advanced an opinion, founded on facts within my knowledge, that, as it was not originally occasioned by malformation of bones, it was certainly curable, in every case, before that period at which the malformation of the bones begins, *i. e.* after the * *ossification is complete*. Succeeding facts have justified the propriety of my opinion; they have gone

* In saying '*after the ossification is complete*,' I allude to that period (about two or three years of age) when the whole of the bones cease to be cartilage, except the extremities, which remain so to provide for the future growth of the bones, till the animal arrives at maturity.

gone farther, they have proved, that this disease may be, and has been cured, after a considerable degree of malformation of bones must have taken place. It is probable, that many more may be cured, when patients are much farther advanced in life; it therefore now becomes necessary to examine, by what alteration in the state of the bones such cures can be effected, as well as by what means those effects are to be produced. The powers of the agents will be considered in another place; the object at present is, to ascertain, as nearly as possible, by what actions of the system the form of the bones can be altered; at what period those bones cease to be susceptible of alteration; and what obstacles may, in any case, render the disease absolutely incurable.

To do this, it will be necessary to trace the origin and progress of the formation of bones, from a very early period, to the time in which they may no longer be susceptible of alteration, in point of form. This I shall do, in the words of the Author I have already quoted.

' All * the bones in the body, both in
 ' the human foetus, and in other animals,
 ' are merely cartilage before the time of
 ' birth. The whole foetus is gelatinous ;
 ' the bones are a pure, almost a transparent
 ' and tremulous jelly ; they are flexible, so
 ' that a long bone can be bended into a
 ' complete ring ; and no opacity, nor spot
 ' of ossification, is seen.

' This cartilage never is hardened into
 ' bone ; but, from the first, is an organised
 ' mass. It has its vessels which are at first
 ' transparent, but which soon dilate ; and
 ' whenever the red colour of the blood be-
 ' gins to appear in them, ossification very
 ' quickly follows, the arteries being so far
 ' enlarged, as to carry the coarser particles
 ' of the blood. The first mark of ossifica-
 ' tion is an artery, which is seen running
 ' into the centre of the jelly, in which the
 ' bone is to be formed. Other arteries soon
 ' appear, overtake the first, mix with it, and
 ' form a net work of vessels : then a centre
 ' of ossification begins, stretching its rays
 ' according to the length of the bone, and
 ' then

* Anatomy of the Bones, &c. by JOHN BELL.

‘ then the cartilage begins to grow opaque,
 ‘ yellow, and brittle ; it will no longer bend,
 ‘ and the small nucleus of ossification is felt
 ‘ in the centre of the bone, and when touch-
 ‘ ed by a sharp point, is easily known by its
 ‘ gritty feel. Other points of ossification
 ‘ are successively formed. Always the ossi-
 ‘ fication is foretold by the spreading of the
 ‘ artery, and the arrival of red blood. Every
 ‘ point of ossification has its little arteries,
 ‘ and each ossifying nucleus has so little de-
 ‘ pendence on the cartilage in which it is
 ‘ formed, that it is held to it by those arte-
 ‘ ries only ; and when the ossifying cartilage
 ‘ is cut into thin slices, and steeped in
 ‘ water till its arteries rot, the nucleus of
 ‘ ossification drops spontaneously from the
 ‘ cartilage, leaving the cartilage like a ring,
 ‘ with a smooth and regular hole where the
 ‘ bone lay.

‘ The colour of each part of a bone is
 ‘ proportioned exactly to the degree in
 ‘ which its ossification is advanced. When
 ‘ ossification begins in the centre of a bone,
 ‘ redness also appears, indicating the pre-
 ‘ fence

‘ fence of those vessels by which the bony
 ‘ matter is to be poured out. When the
 ‘ bony matter begins to accumulate, the
 ‘ red colour of those arteries is obscured,
 ‘ the centre of the bone becomes yellow or
 ‘ white, and the colour removes towards
 ‘ the ends of the bone.

‘ In the centre of the first colouring of
 ‘ the bone is a cloudy, diffused, and general
 ‘ red, because the vessels are profuse. Be-
 ‘ yond that, at the edges of the first circle,
 ‘ the vessels are more scattered and sparse,
 ‘ distinct trunks are easily seen, forming a
 ‘ circle of radiated arteries, which point to-
 ‘ wards the heads of the bone. Beyond that
 ‘ again, the cartilage is transparent and
 ‘ pure, as yet untouched with blood; the
 ‘ arteries have not yet reached it, and its
 ‘ ossification is not begun. Thus, a long
 ‘ bone, while forming, seems to be divided
 ‘ into seven various coloured zones. The
 ‘ central point of most perfect ossification
 ‘ is yellow and opaque; on either side of
 ‘ that there is a zone of red; on either side
 ‘ of that, again, the vessels being more
 ‘ sparse,

' sparse, form a vascular zone; and the
 ' zone at either end, is transparent or white.
 ' The ossification follows the vessels, and
 ' buries and hides those vessels by which it
 ' is formed: the yellow and opaque part
 ' expands and spreads along the bone;
 ' the vessels advance towards the heads of
 ' the bones; the whole body of the bone
 ' becomes opaque; and there is left only a
 ' a small vascular circle at either end. The
 ' heads are separated from the body of the
 ' bone by a thin cartilage; and the vessels of
 ' the centre, extending still towards the ex-
 ' tremities of the bone, perforate that car-
 ' tilage, pass into the head of the bone, and
 ' then its ossification also begins, and a
 ' small nucleus of ossification is formed in
 ' its centre. Thus the heads and the body
 ' are, at the first, distinct bones, formed
 ' apart, joined by a cartilage, and not
 ' united till the age of fifteen or twenty
 ' years.

' This process, so difficult and slow, is
 ' assisted by every provision of nature. The
 ' progress of the whole is slow, that so
 ' long

' long as the body increases in stature, the
 ' bones also may grow : but it is assisted
 ' in the individual parts, where some are
 ' slow, some rapid in their growth,
 ' some delayed, as the heads of joints, that
 ' their bones may be allowed to extend,
 ' and others hastened, as the pelvis, that it
 ' may acquire perfect size in early life.
 ' Ossification is assisted by the softness of
 ' the cartilaginous bed in which the bone
 ' is formed ; by those large and permeable
 ' vessels which carry easily the grosser parts
 ' of the blood ; by a quick and powerful
 ' absorption, which all along is modelling
 ' the bone ; and, most of all, by being
 ' formed in detached points, multiplied
 ' and crowded together, wherever much
 ' bone is required.

' There is one central ring first ossified
 ' in a long bone, as of the leg or arm ;
 ' the heads or ends of the bone are, at first,
 ' mere cartilage, but they also soon begin
 ' to ossify ; the body stretches in a ra-
 ' diated form towards either head ; the
 ' the heads ossifying each in its centre also

3

' stretches

' stretches towards the bone: the heads
 ' meet the body, and join to it; a thin car-
 ' tilage only is interposed, which grows
 ' gradually thinner, till the twentieth year,
 ' and then disappears, the body, heads,
 ' and processes, becoming one bone. In
 ' flat bones, as in the scull, ossification goes
 ' from one or more central points, and the
 ' radiated fibres meet the radii of other
 ' ossifying points, or meet the edges of the
 ' next bone. *The thick round bones, which*
 ' *form the wrist and foot, have each one ossifica-*
 ' *tion in their centre, which is bounded by car-*
 ' *tilage all round.* The processes are of-
 ' ten distinct ossifications, joined to the
 ' bones, like their heads, and slowly con-
 ' solidated with them into firm bones.'

As the preceding long quotation from
 Mr. J. BELL's valuable work, includes
 every fact respecting the formation of bones,
 that is necessarily connected with the sub-
 ject of the present enquiry, I trust I shall
 be excused for having inserted it, rather
 than attempt to relate the same facts in any
 other words.

K

As

As opportunities of examining subjects that have laboured under this deformity, do not occur so frequently as to enable us to demonstrate the facts I have endeavoured to establish, respecting the state of the parts concerned in this disease, I was obliged to assume it as a fact, that the bones were not, when considered separately, deformed, before the patients had attained the age of two or three years; but the uniformity of my success in curing it in children of that age, which was formed on that idea of the disease, and cannot be explained consistently with any other, may now be said to amount to positive proof, that no malformation of bones does take place before that period. My present attempt to ascertain, under what circumstances the disease is or is not curable, in patients after that time of life, must, in like manner, assume the form of conjectures, founded on observing what has passed, or is passing under my eye, in patients of greater age, and deductions from what we know of the animal economy in persons of that age; and if fu-
ture

ture facts should prove equally successful, the doctrine will then be permanently established by practice, to the greatest extent to which it can be carried.

As the situation of a child now under my care will tend to elucidate this part of the subject, I shall briefly describe the state I found him in.

He was more than four years old when I first saw him ; he was born with two feet, exactly resembling Case IV. Page 15. As his parents were informed nothing could be done, nothing had been attempted to relieve him. He began to walk at the usual time, and had walked ever since, wearing only common half-boots, with the notion of enabling him to walk rather better than he would do without assistance.

This case, according to notions generally received, was to be considered as absolutely incurable, and perhaps incapable of alleviation. The bones were completely

K 2

ossified :

ossified* : at his age, and from the circumstance of his having walked at least two years upon them, there must have been considerable malformation of bones, and, therefore, according to all established opinions, the disease was irremediable. As observations I had made in other cases induced me to believe this patient might be much relieved, perhaps perfectly cured; as the consideration of this case includes every circumstance that can render the cure of any other case, after the age of two years, doubtful, or otherwise, I shall particularly explain the state of his feet, and the reflections that occurred to me on examining them.

His toes pointed inwards, directly towards each other: when he stood, the os cuboides of each foot was on the ground, the feet seemed perfectly rigid, and there was no perceptible difference between them; but their

* It will be more correct to say, they were no longer in the cartilaginous state, but as completely ossified, as the bones of children usually are at that age.

their condition will be better understood, by referring to the annexed figures, which I drew from the life.

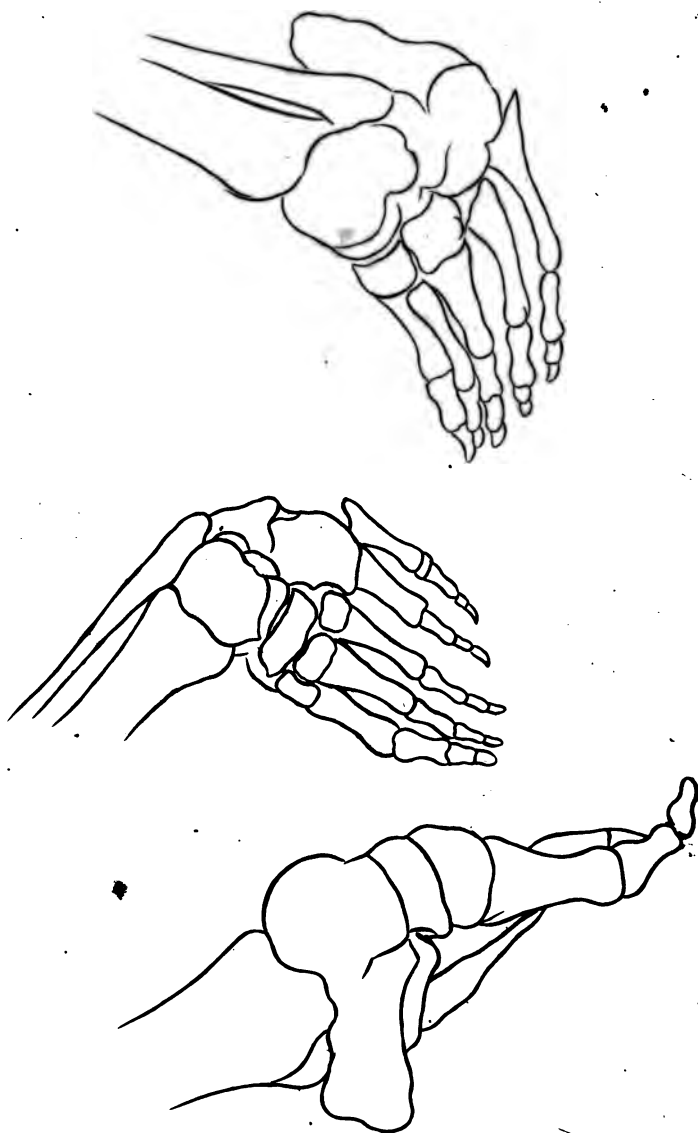
Pl. X. contains three views of one of the feet, *viz.* the outside, the inside, and the top of the foot. The dotted lines indicate the position of the bones, as nearly as I could ascertain their situation through the integuments: the black lines in the top view, indicate the position of the tibia and fibula.

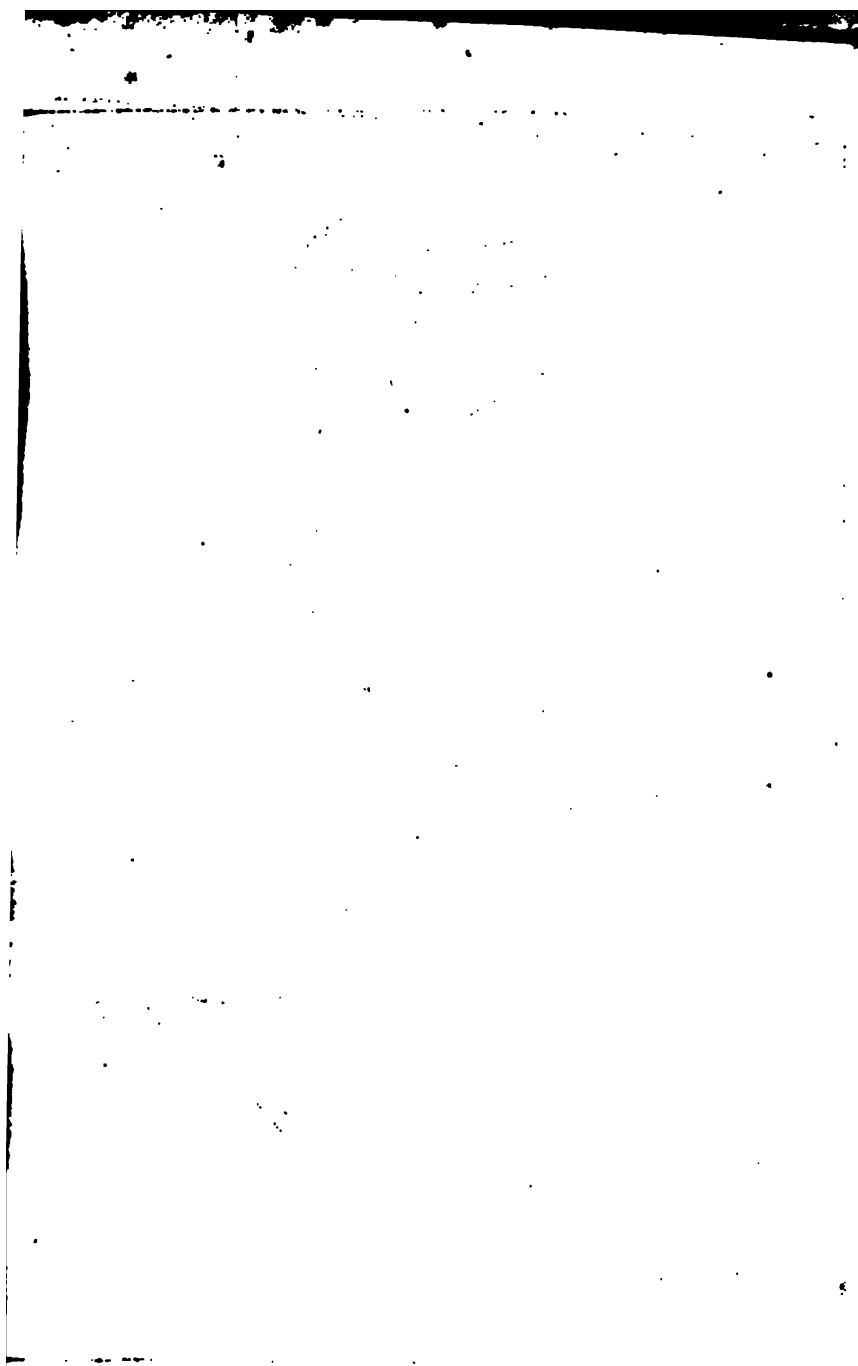
The position of the foot was such, that the circular head of the astragalus, which ought to lie under the tibia, projected considerably forwards and outwards; therefore the os calcis, which should have rested on the ground when he stood, was moved close to the tibia on the inside of the leg, and gave the appearance of a very short heel. The os cuboides was so much distorted from its natural situation, as to bring its upper surface on the ground, when he stood. That part of the astragalus which should be joined to the os naviculare, seemed to project much;

much; the os naviculare turning downwards, and inwards from it, at a very acute angle. The cuneiform bones made a similar angle, with respect to the naviculare. The first phalanx of the metatarsus, formed a similar angle, with respect to the cuneiform bones and cuboides; but all the other bones of the metatarsus were in their natural positions, with respect to the first phalanx.

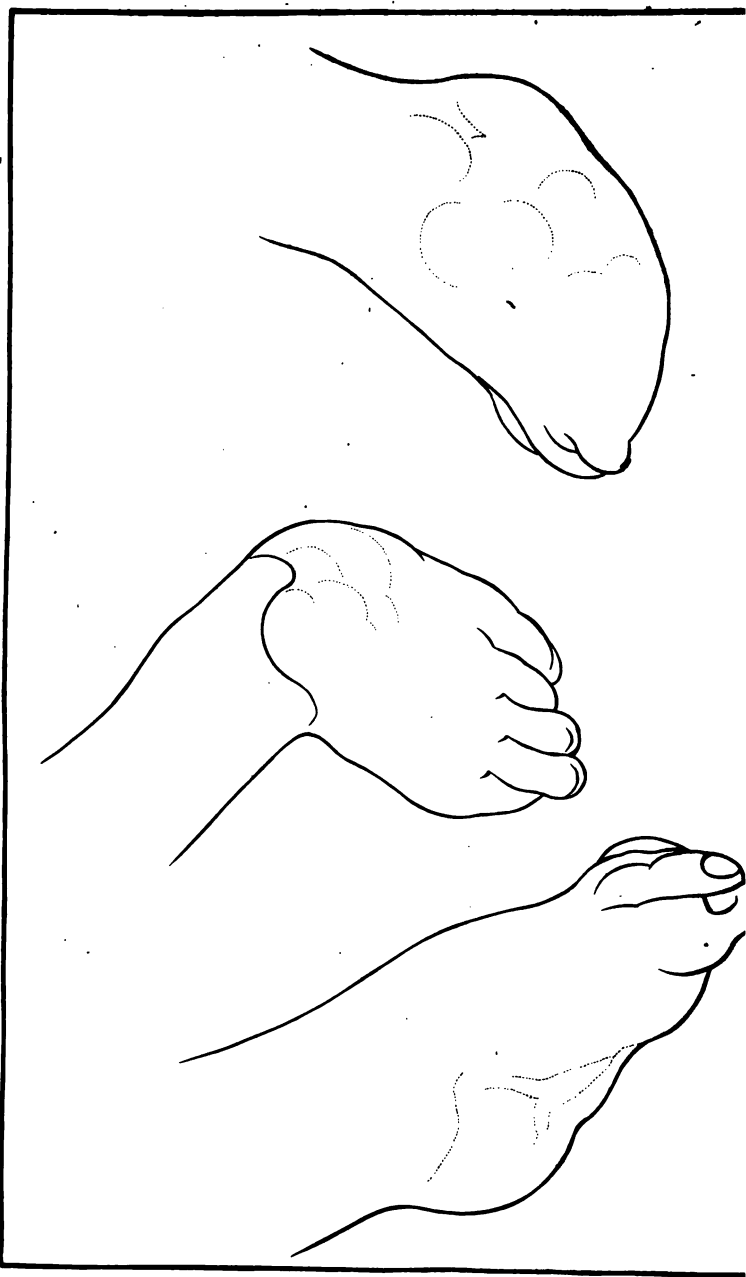
The general aspect of the case, when the child stood on his feet, was this; the astragalus so much out of its place, that its circular head presented itself before the fibula, much of the os calcis laying under the scaphoid cavity of the tibia; the os cuboides so placed, as to bear the weight of the body when he stood; and the toes pointing directly towards each other, instead of standing strait forwards. Considering the foot superficially, it was much broader and thicker than it should be, with almost no heel. That it would finally and irrecoverably have acquired that form, there can







Pl. 10.



can be no doubt ; but I trust a short time will shew, that it has not done so.

I then placed the dry bones of an adult foot, as nearly as possible, in the same situation. I drew three * views of these bones, (*Pl. XI.*) to correspond with the preceding. By comparing these (*Pl. X. and XI.*) together, a more accurate idea of this child's feet, (allowing for what malformation had actually taken place) may be obtained, than can be conveyed by any other means.

Upon examining the bones in this situation, it must appear, that those parts of them which form the under, and inside of the foot, are close together; but those parts of the same bones which are on the upper, and outside of the foot, have considerable spaces between them. This circumstance deserves particular attention, as it will serve to explain my ideas of the disease in its
earliest

* I do not pretend, by these sketches, to represent correctly, the form of bones, but merely to indicate their relative position in the diseased foot.

earliest stages, before any malformation of bones has taken place.

If the foot of an adult could, by luxation, or other means, be placed in a similar position, the bones of that foot would be in the same situation, with respect to each other, as those I have drawn. If the foot of the foetus in utero is, by compression, or whatever other means it is occasioned, placed in a similar position, the bones, or rather the cartilages which are afterwards to become bones, are in the same relative situation. It is from this state of the parts only, that the uniform success with which I have reduced these feet to their natural state, in a short time, can be accounted for; for the time, in some cases so little as twenty days, does not allow us to believe any alteration in the form of individual bones can have taken place. But if it shall be supposed, that in this stage of the complaint, there is any malformation of bone, then the advantage of undertaking the cure as early as possible, must be admitted, upon the commonly received notion, that the
softness

softness of the bones renders that stage of the complaint peculiarly favorable for compressing them into their natural form.

When a child, born with such feet, has remained twelve, or perhaps eighteen months, without any attempt being made to reduce them, a material alteration has taken place in the condition of the bones. A considerable part of the round bones, and perhaps the head of the tibia, are ossified; and as in the growth of the patient, the increase of cartilage precedes the formation of bone in those parts, the cartilaginous part (if I may be allowed the expression) of the bones concerned in the disease, begins to assume an unnatural form; because they will grow, for want of the natural compression, till the spaces between the superior parts of the bones of the tarsus is filled up, by the proportionable growth of each bone, till they meet. In this stage, the progress of the cure is more tedious, because one part of it consists in preventing the farther growth of those superabundant parts, and even diminishing that mal-

L

formation

formation which has already taken place, by compressing the foot into a proper situation : still, allowing for the additional trouble occasioned by the advanced age of the patient, the cure has always been complete.

But in the last stage, when all the bones are completely ossified, that is, when the whole substance of them is really become bone, though softer than the bones of an adult, and covered with cartilage in every direction, to provide a bed for its future increase, when the patient has walked, and thus perhaps increased the original deformity and distortion, we are no longer justified in saying all such cases may be cured. The doctrine I hope to maintain is, that many of them may still be cured, provided no insurmountable obstacle is opposed by the accidents of any given case : and as both the doctrine and the nature of the accidents that may arrive will be illustrated by the case I have already mentioned, I shall proceed with my examination of it.

The

The most striking peculiarity of this case, and the circumstance of most importance in this, and all similar cases, is, the position of the astragalus; its circular head projecting forwards, almost removed from under the tibia, and the end of that bone occupying much of the space between the head of the astragalus and the os calcis.

The scaphoid cavity of the tibia was certainly intended to receive the head of the astragalus; and all the motion of the body over the foot, depends more upon the natural form and juxta position of those parts being preserved or restored, than upon any other circumstance. In the formation of the foetus there is, no doubt, a natural arrangement of parts, tending to facilitate its growth and progress towards its final form, if I may be permitted to use the expression: there is a disposition to grow progressively into that form; but the final accomplishment of that purpose depends upon the natural action of all the parts being preserved or restored, and afterwards kept up, during the whole progressive growth of the animal, till it arrives at maturity.

turity. In the parts we are now considering, the continual friction of the scaphoid cavity over and upon the head of the astragalus, from the time the child first moves its foot, till it arrives at maturity, certainly preserves and maintains their natural form; and by this means, their capacity for their natural action. By the derangement of those parts in this disease, the natural action is immediately impeded, and, for the time, in many cases, destroyed. If the derangement continues, the parts, for want of mutual friction, begin to assume a new and unnatural form. The scaphoid cavity may be so far obliterated, as not to receive the head of the astragalus, if *that* could be reduced into its situation; or the head of the astragalus might assume such a form, as would for ever prevent it from being replaced in the scaphoid cavity, if *that* were capable of receiving it. In either case, the deformity must be irremediable; for, however perfectly the other parts of the foot might be restored to their natural form, the defect remaining in this grand centre, over which the body is moved, must ever prevent
them

them from moving in the natural way ; on the contrary, however imperfect the rest of the foot may remain, if the natural, relative position of the tibia and astragalus can be restored, the patient may be enabled to walk with tolerable ease and activity. After the age of two or three years, the possibility of effecting this must vary, according to circumstances. In the present instance, I thought it practicable ; and therefore have ventured to say, he will at least be so far cured, as to have his feet rendered serviceable.

In examining the other bones of the foot, in this case, I found the os naviculare bending inwards, and forming an acute angle, in this direction, with respect to the astragalus ; and that part of the astragalus which should join to the naviculare, when in the natural state, in this case seemed to form an unnatural projection on the top of the foot. I say *seemed* to form, because, though in this case there was, from the age of the patient, some enlargement of the bone, in younger children,

children, this enlargement of the upper part of the foot is a deception, occasioned by the improper position of these bones of the tarsus ; but, in patients farther advanced in life, it becomes a malformation of those bones, that is sometimes absolutely incurable.

The cuneiform bones, and the os cuboides, are under the same circumstances as the astragalus ; that is to say, they have, at first, from their position, only the appearance of being enlarged on the top of the foot ; but, in time, that enlargement becomes real, permanent, and at last, perhaps, irremediable.

If those sketches of the dry bones, which I have made to represent the upper and outside of the foot, be examined, it will be seen that there are spaces between the surfaces of the bones, when viewed in those situations ; but if the under side is examined, they will be found close together. In early infancy, the bones of feet distorted in this manner, are in this situation,
fo

so far as relates to form and position. Each individual bone, or, to speak with more propriety, each cartilage that is afterwards to become bone, has its perfect and natural form; but by whatever cause the disease is produced, they are placed in positions similar to those represented in my sketches: whence it happens, that when those obstacles which arise from the condition of the muscles and ligaments are overcome, the bones are immediately placed in their natural position: but when that period arrives, which I have described by saying the ossification is complete, each bone of the tarsus has acquired an unnatural form, because, the spaces that were between the upper parts, are filled up by superabundant ossification of the superior parts of each bone. At this period of the disease, it has been universally believed to be impossible to cure it; but as many facts, within my own experience, have induced me to form a different opinion, I shall be excused for taking this opportunity of investigating the subject a little farther.

While

While the old, erroneous opinions, that bone was an almost unorganised concrete, was formed by layers from the periosteum, &c. &c. prevailed, it is by no means surprising that another erroneous opinion should be engrafted upon them, *viz.* that bone once formed, could never have its form altered. This, in some particular instances, may be true ; because the means of producing alterations in the form of some bones are not known, or because they cannot be applied ; but not from any physical impossibility that can be deduced from the nature of bones. If this can be made evident, if it can be shewn, that in the disease at present under consideration, the means of producing alterations in the unnatural form of the bones of the foot can be applied, all ideas of the impossibility of curing many cases of this disease that have been thought incurable, must vanish.

Mr. JOHN BELL has demonstrated, that
 ‘ Ossification is a process of a truly animal
 ‘ nature. No coagulation will harden car-
 ‘ tilage into bone ; no change of consist-
 ‘ ence

'ence will form the blood into it ; no con-
 ' densation of the periosteum can assimilate
 ' it to the nature of a bone. Bone is not
 ' the inorganic concrete, which it was once
 ' supposed, but is a regularly organised
 ' part, whose form subsists from the first,
 ' which is perfected by its secreting arte-
 ' ries, balanced, as in every secretion, by
 ' the absorbents of the part.' *Page 19.*
 Again. ' Thus every bone has, like the
 ' soft parts, its arteries, veins, and abfor-
 ' bent vessels. *Page 17.*

' Yet, by these experiments with mad-
 ' der, one most important fact is proved to
 ' us ; that the arteries and absorbents, act-
 ' ing in concert, alternately deposite and re-
 ' absorb the earthy particles, as fast as can
 ' be conceived, of the soft parts, or even
 ' of the most moveable and fluctuating hu-
 ' mours of the body. The absorption of
 ' the hardest bones is proved by daily ob-
 ' servation, &c.' *Page 16.*

He has proved too, that the progress
 of ossification of the round bones of the
 M foot,

foot, which I am at present considering, is from the centre of each bone diverging outwards, in the following order, reckoning from the outside towards the centre, first, a transparent, tremulous jelly; then cartilage, in which blood vessels are afterwards seen, and by which the earthy particles are finally deposited, to give the bones strength. Thus it appears, they are always hardest, and most perfectly formed in the centre, and least so in the external parts, where they touch, or ought to touch each other.

There is, no doubt, a natural arrangement of parts, tending to facilitate the growth and progress of the bones towards their final form. There is, likewise, a disposition to grow in any direction, that may be requisite, to supply any defect in the form that may be occasioned by accident: thus, when the bones of the foot have been separated in the manner I have described, and are kept asunder till the child has arrived at the age of three or four

years, the spaces between them are filled up by the unnatural growth of each bone.

As it will hardly be asserted, that we cannot, by bandage adapted with moderate skill, and applied with competent attention, confine a deformed foot in any requisite situation ; and by instruments properly adapted to supply its defects, so far as to enable the patient to walk with a degree of activity, proportioned to the circumstances of the case ; I shall proceed to consider the effects of pressure, when applied, with a view to reduce the deformity of a foot, in which a considerable degree of malformation of bones of the tarsus has taken place.

If so much pressure is applied as to bring the separated parts of those bones into contact, and is invariably supported, it will stop the growth of that gelatinous substance, which is first formed in those parts where the bones come in contact with each other ; in those parts which do not come into contact, it will continue to

M 2

grow

grow till they meet ; the progress of ossification will be continued, in the natural way, till the patient arrives at maturity ; and with no more malformation than existed at the time the pressure was first applied.

If more pressure is applied, and uniformly kept up, the cartilages will be compressed in those parts in which they come in contact ; and if only the natural action of the foot is permitted, will assume a permanent form, as nearly approaching to the natural one, as the pre-existing deformity will admit. This compression of the cartilages will, by condensing their substance, prevent the arteries from shooting so freely into it, in an improper direction, as they would have done but for this impediment, and thus stop the progress of ossification in an improper direction, while that process will go on in the natural way, in every other part, till the patient has arrived at maturity, and every part is completely formed.

If

If the same pressure is uniformly continued, or a greater degree of pressure be constantly applied, the action of the arteries, which deposit the earthy particles nearest the surface of the bones, will likewise be impeded, while the action of the absorbents, which, in the course of circulation, are employed in taking up earthy particles, will be continued in full vigour, if it is not increased; and by perseverance in this process it is certainly possible, that an unequal action, *i. e.* a diminished action of the secreting vessels, and an increased action of the absorbing vessels, may be kept up, and so modified, as to alter the form of these bones, long after they are ossified; and, of course, so much of the deformity of such feet as depends on malformation of the bones, may be radically cured, long after that period of life at which they have generally been thought incurable.

Having said thus much on the bones of the tarsus, their junction with each other, and with the bones of the leg, and the derangement of those junctions, which
take

take place in the disease in question, it only remains to consider the metatarsal bones in the same points of view, to complete this part of the subject.

As the bones of the metatarsus are, in some respects, similar to the cylindrical bones of the leg and arm, the general progress of their formation is the same, *i. e.* the centre is first ossified, and ossification proceeds gradually from thence to each end. There is no reason to suppose the bodies of the metatarsal bones are deformed in this disease, though the heads which unite them to the tarsus, and to each other, certainly are distorted, in some cases. When they are so, it is from the same causes, and in a similar manner to the distortion of the tarsal bones. They are liable to the same alterations, both in their diseased state, and their progress towards a cure: and as these circumstances have been fully explained, in speaking of the bones of the tarsus, it will be needless to repeat what has been said of them here.

I have

I have thus endeavoured to prove, that before the age of two years the individual bones of a club-foot are not distorted in any manner ; that as far as the bones are concerned in the disease, it is only by improper combination ; that after the age of two years, individual bones become deformed, according to circumstances which vary in different cases ; but which do not, in all, render the disease incurable. I shall now proceed to examine the condition of the ligaments, in various stages of the disease, in order to discover what alterations must be produced in them, in order to effect a cure.

OF THE LIGAMENTS AND MUSCLES.

As those who are acquainted with the number and variety of the ligaments which connect the bones of the foot with each other, and with the leg, will agree that it is needless to enter into a minute description of them all, on this occasion ; and as those who are not acquainted with them would
not

not comprehend that description, I shall confine myself to such general observations on their nature and properties, as will explain the changes they must undergo, in the progress of a club-foot, from the diseased to the perfectly natural state ; prefixing, however, such descriptions of them as are requisite, in the words of the author I have already quoted.

‘ The * periosteum which has run
 ‘ along one bone, leaves it at the head, and
 ‘ forming a bag for the joint, goes onwards
 ‘ to the next bone. Thus the periosteum
 ‘ of all the bones is one continued mem-
 ‘ brane, passing from point to point ; each
 ‘ bone is tied to the next by its own peri-
 ‘ osteum, and this membrane betwixt the
 ‘ end of one bone, and the beginning of
 ‘ the next, is so thickened into a strong
 ‘ and hard bag, as to form the capsule of
 ‘ the joint ; and the periosteum is assisted
 ‘ in performing this office, by the tendons,
 ‘ fascia,

* Anatomy of the Bones, &c. by J. BELL, page 409.

• fascia, burſæ, and all that confuſion of
 • cellular ſubſtance which ſurrounds the
 • joint. The *capsule* of the *joint* is then a
 • firm and thick bag, which, like a liga-
 • ment, binds the bones together, keeps
 • their heads and proceſſes in their right
 • places, contains the glairy liquor, with
 • which the heads of moving bones are be-
 • dowed, and prevents the adjacent parts
 • falling inwards, or being caught betwixt
 • the bones, in the bendings of the joints.
 • The capsule of every joint proceeds from
 • the periosteum, and is ſtrengthened by
 • the tendons ; it is formed like theſe parts,
 • out of the cellular membrane ; and when
 • a bone is broken, or its periosteum de-
 • ſtroyed by any accident or diſeaſe, when
 • a tendon ſnaps acroſs, when a joint is
 • luxated, and the capsule torn, the injury
 • is ſoon repaired by a thickening of the
 • cellular ſubſtance round the breach ; and
 • wherever a bone, being luxated, is left
 • unreduced, a new ſocket, new periosteum,
 • new ligaments, and new burſæ, are
 • formed out of the common cellular ſub-
 • ſtance ; and though the tendons may
 N have

‘ have been torn away from the head of
‘ the bone, they are fixed again, taking a
‘ new hold upon the bone.

‘ A joint* is composed of the heads of
‘ the bones swelling out into a broader
‘ articulating surface, and of a thin plate
‘ of cartilage, which covers and defends
‘ the head of each bone ; sometimes of
‘ small and moveable cartilages, which roll
‘ upon the bones, and follow all the mo-
‘ tions of the joint, and, like friction
‘ wheels in machines of human invention,
‘ abate the bad effects of motion. There
‘ are mucous glands, or rather mucous
‘ bags, which convey a lubricating fluid ;
‘ and there is a bursal ligament, which
‘ forms the purse of the joint, bends the
‘ bones together, contains the synovia, and
‘ prevents the surrounding parts from be-
‘ ing caught in the joint. There are lesser
‘ ligaments on the outside of this, going
‘ along the sides of the joint, and passing
‘ from

* Anatomy of the Bones, &c. by J. BELL, page 414.

‘ from point to point ; there are great
 ‘ tendons moving over the joint, and bursæ
 ‘ or mucous bags, which accompany these
 ‘ tendons, and prevent the violence which
 ‘ their continual rubbing might do to the
 ‘ bones.’

Speaking of the ancle joint, he says,
 ‘ The ancle joint* owes less of its strength
 ‘ to ligaments, than to the particular forms
 ‘ of its bones ; for while the strong lateral
 ‘ ligaments of the knee guard it, so that it
 ‘ cannot be dislocated till they are torn, the
 ‘ lower heads of the tibia and fibula so
 ‘ guard the foot, that it cannot be luxated
 ‘ sideways, without such violence as breaks
 ‘ those bones. First, the fibula is so con-
 ‘ nected with the tibia, at the lower end,
 ‘ that they form together one cavity for
 ‘ receiving the astragalus, with two pro-
 ‘ jecting points, the fibula forming the
 ‘ outer ancle, and the tibia forming the
 ‘ process of the inner ancle. The joining

N 2 of

* Anatomy of the Bones, &c. by J. BELL, page 452.

of the fibula to the tibia here, is like that
 of its upper end, too close to admit of
 the smallest motion, and it is thoroughly
 secured by particular ligaments, one of
 which passing from the fibula to the tibia,
 on the fore part, is named the *ligamentum*
superior anticum, consisting, in general, of
 one or two distinct flat bands. Another
 more continued and broader ligamentous
 membrane, goes from the fibula to the
 tibia, across the back part, and is named
ligamentum posticum superius; the *ligamen-*
tum posticum inferius being but a slip of
 the same. Next comes the capsule of the
 joint, which joins the astragalus to the
 lower heads of the tibia and fibula. It is
 thinner, both before and behind, than
 we should expect, from the strength of
 a joint, which bears all the weight, and
 the most violent motions of the body;
 but, in fact, the capsule every where
 serves other purposes than giving strength
 to the joint, and never is strong, except
 by additional ligaments from without. So
 it is with the ankle joint, the capsule of
 which is exceedingly thin before; but it
 is

' is strengthened at the back part, and
 ' especially at the sides, by supplementary
 ' ligaments. First, a strong ligament comes
 ' down from the acute point of the inner
 ' angle, expands in a radicated form upon
 ' the general capsule, adheres to it and
 ' strengthens it, and is fixed all along the
 ' sides of the astragalus. This ligament,
 ' coming from one point, and expanding
 ' to be inserted into a long line, has a trian-
 ' gular form, whence it is named *ligamen-*
 ' *tum deltoides*; and while the general liga-
 ' ment secures the joint towards that side,
 ' the oblique fibres of its fore edge prevent
 ' the foot being too much extended, as in
 ' leaping, and its oblique fibres on the
 ' back edge prevent its being too much
 ' bended, as in climbing; but the liga-
 ' ments of the outer angle, tying it to the
 ' outer side of the astragalus, are indeed
 ' distinct, one going forwards, one going
 ' backwards, and one running directly
 ' downwards: one goes from the point or
 ' knob of the fibula, obliquely downwards
 ' and forwards, to be inserted in the side
 ' of the astragalus: it is square and flat,
 ' of

‘ of considerable breadth and strength ; and
 ‘ is called *ligamentum fibulae anterius* : ano-
 ‘ ther ligament goes perpendicularly down-
 ‘ wards, from the acute point of the out-
 ‘ ward angle, to spread upon the side of the
 ‘ astragalus, and of the capsule, and is fi-
 ‘ nally inferted into the heel bone ; this is
 ‘ named the *ligamentum fibulae perpendiculare* :
 ‘ a third ligament goes out still from the
 ‘ same point, to go backwards over the
 ‘ back part of the capsule, adheres to the
 ‘ back of the capsule, and strengthens it,
 ‘ and is named *ligamentum inter fibulam et as-
 ‘ tragalum posterius*.’

Again, describing the joints of the foot,
 he says, ‘ The *os astragalus, os calcis, os
 ‘ naviculare, and all the bones of the tar-
 ‘ fus, are united to each other by large
 ‘ heads, and distinct and peculiar joints ;
 ‘ besides which, the bones are cross-tied to
 ‘ one another by ligaments, so numerous
 ‘ and complicated, that they cannot, nor
 ‘ need

* Anatomy of the Bones, &c. by J. BELL, page 455.

' need not be explained. They pass across
 ' from bone to bone, in an infinite variety
 ' of directions, some longitudinal, some
 ' transverse, and some oblique. There is
 ' a curious complication, which we may
 ' call a web of ligaments, covering either
 ' side of the foot with shining and star-like
 ' bundles. Each bone has its capsular li-
 ' gaments, for joining it to the next; each
 ' joint of each bone has its articulating
 ' cartilages, always fresh and lubricated;
 ' each joint has, besides, its capsular flat
 ' stripes of oblique, longitudinal, and trans-
 ' verse ligaments, joining it to the nearest
 ' bones; and the greater bones have larger
 ' and more important ligaments, as from
 ' the astragalus to the os calcis, from the
 ' os calcis to the os naviculare, and from
 ' that to the scaphoid bone, &c. &c.

' The metatarsal bones have their cap-
 ' sular ligaments, joining them to the tarsal
 ' bones, and they have ligaments strength-
 ' ening their capsules, and tying them
 ' more strongly to the tarsal bones; and,
 ' as in the metacarpal bones, the several
 ranks

' ranks are tied one to another by cross
 ' ligaments, which pass from the root of
 ' one bone to the root of the next. We
 ' have ligaments of the same description
 ' and use, holding the metatarsal bones
 ' together, both on the upper and on the
 ' lower surface of the foot; and all the li-
 ' gaments of the foot are of great strength
 ' and thickness. The lower ends of the
 ' metatarsal bones have also transverse li-
 ' gaments, by which they are tied to each
 ' other. The toes have hinge-joints, formed
 ' by capsules, and secured by lateral liga-
 ' ments, as those of the fingers are; and,
 ' except in the strength and number of
 ' ligaments, the joinings of the carpus,
 ' metacarpus, and fingers, exactly resemble
 ' the joinings of the tarsus, metatarsus,
 ' and toes.

' But these ligaments, though helping
 ' to join the individual bones, could not
 ' have much effect in supporting the whole
 ' arch of the foot. It is further secured
 ' by a great ligament, which extends in one
 ' triangular and flat plate, from the point
 ' of

of the heel to the roots of each toe.
 This is named the *aponeurosis plantaris pe-*
dis, which is not merely an aponeurosis
 for covering, defending, and supporting
 the muscles of the foot ; that might have
 been done on easier terms, with a fascia,
 very slight compared with this ; but the
 chief use of the plantar aponeurosis is in
 supporting the arch of the foot. It passes
 from point to point, like the bow-string
 betwixt the two horns of a bow, and
 after leaping, or hard walking, it is in
 the sole of the foot we feel the hard
 straining and pain ; so that, like the pal-
 mar aponeurosis, it supports the arch,
 gives origin to the short muscles of the
 toes, braces them in their action, and
 makes bridges, under which the long ten-
 dons are allowed to pass ; it comes off
 from the heel in one point ; it grows
 broader, in the same proportion as the
 sole of the foot grows broad. It is di-
 vided into three narrow heads, which
 make forks, and are inserted into the
 roots of the second, third, and fourth
 toes ; and the great toe and the little toe
 O have

‘ have two smaller or lateral aponeurosis,
 ‘ which cover their own particular muscles,
 ‘ cles, and are implanted into the roots of
 ‘ the great toe and little toe.’

From these demonstrations of the ligaments of the joints of the ankle, the tarsus, and the metatarsus, which I have extracted from Mr. BELL's valuable work, and from what has been said of the condition of the bones in various stages of club-foot, the condition of the ligaments, in different stages of this disease, may be well understood. Upon referring to the situation of the bones of the foot, as I have already sketched them, it will be seen, that the bones are, on the upper and outside of the foot, at some distance from each other; and if nothing is done to alter that position, will continue so, till the period of life at which the improper growth of each bone has filled up the interstices between them. On the under, and inside of the foot, the bones are always as close together as in the natural state. Now as the capsular ligaments are formed by a continuation of the
 peri

periosteum, passing from one bone to the next, as the bones of the foot are originally gradually placed, so as to grow into this form, the capsular ligaments must derive a peculiarity of form from the accidental position of the limb. As the bones of the tarsus have no perceptible motion on each other, the capsules which connect them, unite them closely together, and keep them firmly so, when in their natural state; and in this disease, the capsules on the under side of the foot, are in the same condition, *i. e.* they unite the bones of the foot firmly and closely together; but on the upper side of the foot, as they pass from one bone to the next, their extraordinary length must be exactly equal to the unnatural distance between those bones. If, therefore, we consider this part of a foot, so diseased, and suppose it divested of every obstacle, from the state of the muscles, that would prevent us from placing it in the natural state, it would only be requisite to press the upper parts of the tarsal bones together; and as there is not, nor can be much, if any contraction in the capsule on the un-

der-side of the foot, there would be no obstacle in preventing them from being immediately placed in their natural position. But as the ankle joint is intended to move freely backwards and forward, its capsule must be in the natural state, so formed, as to admit of this motion. In the diseased state, however, the case is very different ; there has never been the natural motion in the parts : the capsule is, therefore, like the capsules of the tarsal bones, a mere continuation of the periosteum, uniting them as firmly together, as their position will allow. Now if the other obstacles which prevent the reduction of the ankle joint to its natural position were removed, we could not, as in the tarsal bones, immediately place the bones concerned in the ankle joint in their natural situation ; because there is a permanent contraction of the capsular ligament on the back of the joint, and the reduction of the bones of the ankle joint, into their natural situation, can never be effected, so long as that contraction continues. Here then, a new operation becomes necessary, *i. e.* by mechanical

nical means, to produce such an alteration in the state of this capsule, as shall allow of the natural quantity of motion. The metatarsal bones have more motion than the bones of the tarsus, and less than the ankle joint, and therefore in the point of view I am now considering them, hold a middle situation between the two: but as the foot is always contracted, so as to draw the toes more or less downwards, and inwards, in this disease, there must always be a permanent contraction of the plantar aponeurosis, exactly proportioned to the degree in the deformity. The other ligaments, which, as they partake of the same general nature, and contribute with the capsular ligaments to preserve the bones in their positions, are to be considered all together in the same point of view, with respect to their contraction, or other deviations from the natural state.

It is this contraction of the ligaments, which constitute the essential part of the disease, before the age of two or three years, when the bones begin to be affected,
and

and afterwards become the most important part of the deformity ; for though there is, likewise, muscular contraction, yet as the muscular fibre is more easily acted upon than the ligament, from its peculiar nature, can be, this must always claim the greatest part of our attention, since it is certain, that whatever means are successfully used to produce the requisite alterations in the ligaments, must necessarily produce, in less than the same time, the requisite alterations in the state of the muscles ; but the reverse of this position can never, in the nature of things, be true.

The ligaments are powerfully elastic, but endued with very little active sensibility, by which qualities they are peculiarly adapted to their functions of binding the bones firmly together, when they should be so bound ; of limiting their motion, when bounds ought to be set to it ; and of resisting the effects of strains of every description, from all the violent actions to which the parts may safely be rendered liable. But if forced beyond this, a material alteration

alteration takes place in all their sensible properties. If a limb is strained by any action, too violent for the parts to bear, and the ligaments are not lacerated, they are forcibly extended in length, inflammation comes on, sensibility is excited to a degree, of which very few other parts are susceptible, and, too frequently, the most dreadful consequences ensue. If these are averted, and the sensibility and inflammation removed, the parts are, for want of sensibility, and from other properties, peculiarly slow in recovering their natural tone and full power of performing their natural functions. In a young growing animal they *may* perfectly recover it, but in an adult, or old one, almost never; as is too well known to those who have opportunities of observing the consequences of sprains, often apparently slight, and too sorely experienced by those to whom such accidents happen.

Now as the essential operation to be performed, in curing a club-foot, is to produce such an extension of some of the ligaments, as, if it happened by accident, would
 constitute

constitute a considerable sprain, it certainly
 is the duty of the operator, so to conduct this
 operation, that none of the consequences
 which would have taken place from an acci-
 dental sprain, shall ensue. If he does not do
 this, he will certainly leave his patient in a
 worse condition than he found him; for a
 child had, no doubt, better be lame from
 deformed feet only, than from the same
 deformity combined with debility, arising
 from luxation, or sprains from injudicious
 treatment. This circumstance has always
 been so strongly impressed on my mind,
 that after the maturest consideration, and
 reiterated experience, I feel myself justified
 in laying it down, as a rule most proper
 to be followed, to employ something more
 time than may be absolutely necessary
 to effect the reduction, rather than risk the
 consequences of a more precipitate pro-
 ceeding. I have, indeed, when called to
 a patient in the country, or at a distance
 from home, when the time of my atten-
 dance was necessarily limited, proceeded in
 the necessary operations with all possible
 dispatch; but always with a degree of an-
 xiety.

xiety I would not willingly encounter, and a risk to the patient, which nothing but necessity can justify us in hazarding. I have, indeed, never seen any accident happen, in my own practice, from precipitate treatment; but shall be excused for relating the following case, to shew the consequences of rashness and ignorance united.

A Gentleman had a son born with two club-feet. He had been told I had discovered a method of curing this disease, and had a patent for the invention; and for this reason, he intended to put the child under my care. But he accidentally met with a youth, whose ignorance can only be equalled by his dishonesty, who assumed my name and character, declared himself the inventor and patentee, and undertook to cure the child. He might have examined my specification in the office, as it was not then published; he might have suborned some of my servants to give him some information of the instruments I use; For he certainly did make such imitations of them, as would have subjected him to a

prosecution, had I chosen to put the laws in force against him. For a very short time he exulted in his success, for the child was said to get better; but, in a few days, there was a general inflammation of both legs, and he was obliged to desist. Unfortunately for the patient, this inflammation subsided in a few days; I say *unfortunately*, since it induced the parents to subject the child again to this treatment, when fresh inflammation was produced, to a more dangerous extent, and more permanent in its effects; for notwithstanding a considerable time has elapsed since this empiric was discarded, the child remains in the same condition; the feet deformed, as at first, and apparently weak and useless, from the severe treatment they experienced.

There can be no doubt, but that by assuming my name and character, and calling himself the inventor of the method of curing the disease, his intention was to defraud me of the reputation, and what little profit could be obtained from the case. The cautions that were given him to desist, perhaps,

haps, only stimulated him to perseverance, and induced him to exert himself to support his imposture, and shew how much he could do; but as he is in the most perfect ignorance of every part concerned in the disease, it is not surprizing, such an undertaking should terminate in his disgrace; though it is difficult to conceive what apology he can make to a Gentleman, for having so treated his child. The event of this case may serve as a necessary caution to the unwary, to ascertain, correctly, who they confide in, upon an occasion of such importance.

After so much extension of the contracted ligaments has been produced, as will enable us to place the foot in its natural form, a further alteration in the condition of those ligaments must take place, before the cure is complete. The ligaments that have been extended remain weak, and, in that respect, similar to those that have been violently strained, and the inflammation of which has recently subsided. By bringing the upper parts of the tarsal, and metatarsal bones into contact, the ligaments

which connect them are too long and loose for their situation and office; whence the whole foot, instead of being firmly bound together by the ligaments, as in the natural foot, is loose, and may be thrown into many improper positions, by various actions or accidents, and, by this means, occasion a relapse into the former deformity, or give rise to a new one. To prevent this, it will always be necessary to keep the foot bound, by proper instruments and bandages, in its natural position, till the parts have so far recovered their natural powers, as to render this alteration improbable; the patient may then be safely suffered to go without any.

The time requisite to effect this, will vary in patients of the same age, but differently circumstanced with respect to the disease; and it will vary materially, in proportion to the age of the patient. In general, I have found, that in children taken at, or within two months of the birth, a cure will be, in every sense, complete, by the time they begin to walk. If not began till two years old, it will be at least as long before

before a child can go without support : and thus the time requisite to effect a cure will increase, progressively, with the age of the patient, till they have completely done growing, at which period it is possible that some patients may be so far cured, as to have their feet reduced into the natural form ; but it is unlikely, that they should, even then, ever be able to walk without artificial support.

The cause of this difference of time requisite to effect a cure, in patients of different ages, is the peculiar nature of the ligaments, which are less susceptible of alteration than any of the other soft parts of the body. The muscles are, from their texture, easily affected by various diseases : they are strengthened and enlarged by action, they are wasted and debilitated by disease ; but the ligaments, though susceptible of the same alterations, are not so in the same degree. Now as a healthy child grows more in a given time, immediately after the birth, than it does in the same space of time at any future period of its life,

life, and as the progressive alteration in the texture of its parts is slower, in proportion as it advances in life ; as the ligaments are, in every stage, less susceptible of alteration than the other parts, and as a great alteration must be produced in the condition of the ligaments, to cure this disease, we see at once the importance of undertaking the cure as early in life as possible, and by this means, diminishing the trouble necessary to obtain, and the risk of being disappointed of success.

The bones form the basis of the body, give it solidity, and form the foundation on which those parts are fixed, which enable it to move ; the ligaments connect the bones together, firmly, where firmness is required, and admitting of certain degrees of motion, where motion is necessary ; but the muscles are the powers by which motion is performed : and such is the connection between these three parts of the animal, that any derangement in the one, necessarily interrupts the functions of both the others. Having endeavoured to explain
so

so much of the nature of bones and ligaments, as is connected with the disease in question, it only remains to examine the muscles of distorted feet, in the same point of view, to enable us to form correct opinions on the probability of curing them, in the various stages of the disease.

It has been usual to divide the muscles of the foot into flexors and extensors, arranging under the first head the gastrocnemii, the peronei, the tibialis posticus, and plantaris; and to call the tibialis anticus the only extensor muscle of the foot. If this arrangement was correct, it would necessarily follow, that the foot is capable of only one kind of motion, *viz.* flexion and extension, directly forwards; but as we know that it is capable of other motions, when in its natural state, *viz.* a degree of rotation, turning the toe inwards or outwards, and another motion, bending the whole foot upwards and inwards, it is evident, that the opinions that might be deduced from the above arrangement, would be erroneous; and as it is important, in
consider-

considering this disease, that we should understand the situation and action of every muscle of the foot, I trust I shall be excused for dissenting from the common manner of classing them.

Of the muscles called flexors of the foot, three, *viz.* the gastrocnemius, soleus, et plantaris, certainly do bend the foot, and, undoubtedly, have no other motion : they are, perhaps, the strongest muscles in the body, as they lift the whole weight of the body, every step we take, and with a degree of force, proportioned to the action intended in running, jumping, &c. It is the apparent contraction of these muscles, that, for want of a counteracting force, forms a most prominent feature of the disease, as it continually draws the heel upwards, and gives the appearance of preternatural smallness to the os calcis. But this contraction is not the original disease ; for, notwithstanding, as the patient advances towards maturity, the calf of the leg, which is formed of these muscles, wastes entirely away, for want of action,
and

and the whole disease is then, perhaps, incurable. It is certain, that this mischief is solely occasioned by the bones of the foot, which have got into an unnatural position, and thus impede the action of the muscles. So long as the state of the bones does not render a cure hopeless, no insurmountable obstacles are opposed to it, by this apparent contraction of the muscles of the leg,

Although the *tibialis posticus*, and *peroneus longus et brevis*, certainly do, in some circumstances, unite their action with that of the *gastrocnemius*, *soleus*, et *plantaris*, to bend the foot, they have other and distinct functions, in which the latter have no concern, and which deserve particular attention; as the derangement of their natural actions, and the restoration of their natural powers, constitute most essential parts of the disease and the cure.

If we try to bend the foot, as much as possible, into the position of the common club-foot, we find it can be easily inclined very much that way. This is effected by

Q

the

the contractile action of the tibialii muscles; the peroneii are relaxed and quiescent. If we reverse this action, it is effected by contraction of the peroneii muscles, and *consequent* relaxation of the tibialii; and both these motions are to be performed without bringing the gastrocnemii and plantaris into action. It is evident, that in these actions, the tibialii, and peroneii muscles are, alternately, flexors and extensors; and it is, therefore, manifestly incorrect, if not improper, to call the peroneii and tibialis posterior muscles, simply flexors of the foot.

Again, when we point the toe directly downwards, all the muscles, called flexors of the foot, concur in this action, except the peroneus longus, which is chiefly employed in counteracting the tendency of the foot to turn inwards; this it certainly would do, if not so counteracted: and when the foot is raised directly upwards by the anticus, the peroneus longus combines with it in that action, as we find, in this situation, we can turn the toe inwards or outwards,

wards, according as we direct either of those muscles to act. As these actions of the muscles of the foot must be evident to every one who will examine into them, it is difficult to conceive how the *tibialis anticus* can be called the only extensor of the foot, and the six others denominated *flexors*; particularly the *peroneus longus*, whose action is so continually combined with that of the *anticus*, in raising the foot, that, in no instance, can the foot be extended in the natural way, if the action of the former is impeded in any manner.

The action of each muscle has been examined separately; but it is easy to conceive, that no one of them can act entirely by itself. When the foot moves, in any manner, all the muscles are variously put in motion; nay, there are few actions can be performed, without the united power of the leg, foot, and toes: whence it must follow, that any derangement, in any of those muscles, must give rise to a defective and irregular action in the whole limb, and, on many occasions produce additional

distortion. Thus the muscles of the thigh, leg, foot, and toes, are always combined in those actions that contribute to locomotion, though, from the nature of their connection, notwithstanding the thigh may in adult patients be wasted, because distortion of the foot renders the patient less capable of action, yet it is subject to no other derangement. But as the muscles of the toes are much concerned in every action of the foot, every derangement of the parts of the foot must affect those muscles ; and, in a healthy state, their action is of consequence to the motion of the foot itself ; they are, therefore, as much objects of attention, in every stage of the diseased, as those of the foot itself.

There is manifest disproportion in the power of the muscles of the foot itself, considered simply on the idea of flexion and extension ; because the flexors must lift the weight of the body, at every step we take, while the extensors are only to lift the foot, and prepare it for a second step. There is a similar disproportion in the
power

power and action of the muscles of the toes, because there is, likewise, a great difference in their intended functions; for, while the flexors only bend the toes downwards, the extensor longus digitorum pedis, the peroneus tertius, the extensor digitorum brevis, and extensor pollicis proprius, not only extend the toes, but contribute much towards raising the foot, in conjunction with the anticus and peroneus longus. In this light, I believe it has not been usual to consider them; and it may, therefore, not be improper to explain this part of their functions.

The origin of these muscles is on the tibia and fibula: their insertion, in and about the toes, and their contractable power, is divided equally through their whole length; whence it is evident, that when these muscles counteract the flexors of the toes, by contracting themselves, they must necessarily assist in raising the foot, if it is lifted at the same time; acting upon the foot, with respect to the ankle joint; like a cord applied to the extremity

tremity of the long arm of a lever, and thus raising the weight, in the most advantageous manner. This may be ascertained by any person endeavouring to raise the foot, at the same time the toes are kept down, by contraction of their flexor muscles ; and it will be found, that the foot cannot be raised, till the flexor muscles of the toes relax, and the extensors combine with the action of the anticus and peroneus longus, to produce the desired effect.

Such is, nearly, the action of the muscles of the feet and toes, when in their natural state. We are now to examine, in what manner they deviate from this mode of action, when a foot is distorted in that way that has obtained the name of club-foot ; and I shall therefore proceed to examine the worst stage of that disease.

The first, and most prominent feature of this disease, when we consider the state of the muscles, is the apparent contraction, and absolute rigidity of the gastrocnemii, plantaris, and tibialis posterior muscles,

muscles, and the apparent incapacity for motion in the peronei and muscles of the toes. I call these circumstances apparent, because the contraction is not an absolute disease: the position the bones have got into, prevents these muscles from acting, and therefore their power of action seems to be lost; what small degree of motion remains in the foot, is performed by the anticus, which, in consequence of the improper position the foot has taken, draws it more inwards and upwards. All these circumstances, I have seen in the foot of a new-born child: and if others are not so bad at first, as they grow up, if no attempts are made to cure them, these circumstances come on gradually, till the parts of the foot become incapable of any kind of motion, and the bulk of the leg diminishes, by the wasting of the muscles, till it is very little more than the bones covered with the integuments.

During the time that the condition the of bones does not render the disease incurable, no insurmountable obstacle is opposed to the

the cure, by this apparently desperate situation of the muscles; for as no disease exists in the muscles themselves, as in paralytic affections, if the bones can be, and are reduced into their natural form, and relative position, the impediment to action of the muscles is removed, and with proper attention, the action of these muscles, well as their natural form and relative proportion, in growing children at least, may be restored, and thus the cure be rendered complete,

To illustrate these important facts, I took an opportunity to examine an adult patient, who had been born with one club-foot, and to relieve which no attempts had ever been made. I measured the perfect leg, as accurately as a line could be traced on the surface of the skin, in the course of soleus muscle, from its origin at the upper part of the tibia, to the insertion of the tendo achilles on the os calcis, and found, when the heel was raised as much as possible, the whole length was fourteen inches and a half; and when the heel was depressed

effed as much as possible, as in the act of
 limbing, the whole length was sixteen in-
 ches and a half. I measured the anticus
 muscle of the same leg, and found its most
 extended length seventeen, its most con-
 tracted length fifteen inches. The peroneus
 musculus, in its most contracted state, when
 the foot was turned outwards and upwards,

measured nineteen in-
 ches and a half, and in its most extended
 state, when the foot was turned inwards, and
 drawn up, as much as possible, in the posi-
 tion of the club-foot, by the action of the
 tibialis muscles, it measured twenty-three
 inches. These measurements were as ac-
 curately taken as possible; but are, per-
 haps, not perfectly so. They are, how-
 ever, sufficiently accurate for the present
 inquiry; and the result of them shews,
 that in mere flexion of the foot backwards
 and forwards, the anticus and gastrocnemius
 muscles contract and expand to the same
 extent; but the alteration of the peroneus
 musculus, in its two extremes of contraction
 and extension, is nearly twice as much as
 that of either the gastrocnemius or anticus.

It is difficult, from the peculiar functions of the peroneus longus, to name any muscle as its particular antagonist. In the view I am now considering it, it seems to be counteracted by the tibialis anticus and posticus; and it is certain, that neither of them contracts or extends, more than a fourth-part of the length that the peroneus longus does in this action; and this variation from the general principles of muscular motion*, which are, that antagonist muscles move through equal spaces, in counteracting each other, gives it a peculiar character, that will afterwards require particular attention.

The distorted foot, in this patient, was turned inwards and outwards so much, that he stood with the os cuboides on the ground. The length of the soleus, from its origin to the insertion of the tendo achilles on the os calcis, was thirteen inches and a half, and it was perfectly rigid. The length
measured

* I should have said, that part of muscular motion which contributes to loco-motion in the human subject, as the principle is by no means universal.

measured in the course of the anticus was fourteen inches ; but the length of the peroneus longus, as nearly as it could be traced on the foot so deformed, was twenty-five inches and a half.

This is, perhaps, as correct a statement of the difference between the length and size of the muscles of a distorted foot, and a foot naturally of the same size, as can be obtained without dissections, the opportunities for making of which very seldom occur. It proves, that in a disease which had taken place before the birth, and continued without any attempt to remove or diminish it for twenty-five years, which was the age of the patient when I saw him, the actual contraction of the gastrocnemii muscles was but one inch more, in fourteen inches and a half, than the corresponding muscles in the opposite leg continually contracted themselves, in performing their natural functions. As we know that muscular contractions, under some circumstances, to a much greater extent, are overcome, we are authorised to conclude, that if the state of the bones, in this case, had not rendered

dered a cure absolutely impossible, this contraction of the muscles at the back of the leg might perhaps have been overcome.

If it is possible, that this contraction, in an adult, might have been overcome, after it had existed and been increasing during the whole of his life; if we consider, that contraction equally rigid to appearance, but less in degree, in proportion to the difference of the patient's size, takes place in all these cases, and has been supposed to be the principal obstacle to a cure, may we not conclude, that whenever the bones can be reduced to their natural state, this condition of the muscles of the foot will never, for a moment, retard the cure?

A circumstance, more important in itself, and more important because it seems to have been overlooked, is the alteration that has taken place in the exterior muscles of the foot and toes, and more particularly in the peroneus longus, if I am not to call that an extensor of the foot. It is upon the total removal of this circumstance, that the perfection of a cure in this disease al-

ways depends ; it is a point upon which so much depends, and upon which so little stress has been laid, even by those who have been most interested in the welfare of those patients I have under my care, that I trust it will not be thought irrelevant if I attempt to discuss it here.

Considering the muscles only, two operations are necessary to effect a cure ; one, by reducing the foot into its natural form, to remove the contraction that has taken place. In this state, the foot appears well formed, but is useless, as to all purposes of loco-motion ; it will remain in this position so long as it is held or bound, but upon removing the hand or bandage, immediately falls back into its former position. The second operation is, therefore, necessary to keep it in the natural position, till the perfect use of all the parts is obtained, and then a relapse is no more to be feared.

In the comparison I have made between the distorted and the natural foot of a patient, it has been seen, that the peroneus longus on the distorted foot, was two inches and a half

half longer than the same muscle on the natural foot, when extended to the greatest degree that it could be. In the views I have given of the bones of a distorted foot, it has been seen, that from the position of those bones, there are spaces between them at their upper surfaces, which at last become ossified. In this case it is obvious, that all the muscles and integuments must be longer than they are in a foot of the same patient, when in the natural state.

By the operation of reducing the foot into its natural form, those spaces are obliterated, by the reunion of the divided bones; of course the muscles and integuments which cover them, are now longer than they ought to be, therefore they are incapable of performing their natural functions, till this superabundant length is remedied. To know how this can be done, we must make some enquiries into the nature of muscular action.

Muscular motion, so far as it is connected with loco-motion, seems to depend upon this principle, that the flexor and extensor

tenfor muscles of a member are equal in power, and the parts are enabled to perform their functions, continually, by the regular transfer of volition, from flexors to extensors alternately; but the power of executing these functions, depends upon the correct and natural proportion of the parts to each other. Thus we have seen in the leg of which I have given the measurements, that the flexor and extensor muscles, in performing their natural motions, each alternately contracted and extended in the same degree: but in the diseased leg, there was no motion; there was a positive contraction of the gastrocnemii muscles of one inch: and there was an elongation of the peroneus longus, which made it two inches and a half longer than the same muscle in the perfect foot. This case was incurable, from the age of the patient and the form of the bones; but if we suppose a case that is curable, though under the same circumstances, as to form and position of the parts, the first operation would be to reduce the bones into their natural state, by which the capacity for motion would be restored to the foot. The next would be,

to

to produce extension of those muscles that had been contracted, which would be effected in a short time, and thus one of its actions be restored to the foot ; but the patient would still remain lame, and in a great measure helpless, unless due care is taken to preserve the foot in a proper position, till the exterior muscles have likewise recovered their action.

I suppose the size of the muscle of this foot corresponds with the measurement I have already given ; we there see, the peroneus longus is two inches and a half longer than the same muscle in the naturally-formed foot of the same patient, it is evident, that by reducing the foot to its natural form, in the short time it has been effected by my operations, this muscle must be left two inches and a half too long for its antagonists ; or, in other words, by reduction of the foot to its natural form, the peroneus longus, and all the soft parts on the upper part of the foot, would form in wrinkles, and remain so, till by the growth of the patient, and confinement of the foot in a proper situation, the superabundant
part

parts are waisted away, and the whole limb will then regain and keep its natural form and action.

Having thus endeavoured to ascertain the circumstances which constitute the difference between the bones, ligaments and muscles, in the diseased and natural state, considering them separately, it now remains to consider them as united into one whole. As each fibre is united to its fellow by cellular substance, till they constitute a muscle, so the muscles, ligaments, and bones, are united together, by different modifications of the same substance, to constitute a perfect limb. The tendons and ligaments themselves are but modifications of the same substance, differing from each other. The cellular substance that unites them is in the simplest form; but would not answer the purposes requisite for the perfect state of the limb, without farther assistance; as it is evident, from the form and action of the parts, that their tendency to form straight lines from their origin to their insertion, would alter the form of the leg, and impede

S

its

its action, unless assisted by a peculiar provision for that purpose.

This provision is the general fascia which firmly embraces the whole limb, to give strength to every muscle, and the crucial ligaments which are found at the acute angle made at the joining of the foot to the leg. These parts I shall describe in the words of the author *, from whose work I have already made many quotations.

‘ It is often useful, that an individual
‘ muscle should be inclosed in a tendinous
‘ sheath, to give it strength and firmness,
‘ and preserve it in its shape. All muscles, or almost all muscles, form for themselves individual sheaths, such as are seen
‘ inclosing the supra spinatus and infra
‘ spinatus of the scapula, the biceps humeri, and most of the muscles of the leg
‘ and thigh ; but it is especially necessary,
‘ that the whole muscles of the limb should
‘ be enclosed in some stronger membrane
‘ than

* J. BELL on the Bones, &c. p. 406, &c.

' than the common skin, both to give form
 ' to the limb, and strength to its muscles,
 ' and to keep the individual muscles in
 ' their proper places, which otherwise
 ' might be luxated and displaced. And so
 ' the trunk of the body, the arm, the thigh,
 ' the leg, are bound each with a strong,
 ' smooth, and glistening sheath, formed
 ' out of the cellular substance, condensed
 ' and thickened by continual pressure. And
 ' this also is thicker and stronger, accord-
 ' ing to the need that there may be for
 ' such a help. It is hardly to be distin-
 ' guished in the child, grows thicker and
 ' stronger as we advance in years and in
 ' strength; and, in the arms of workmen,
 ' it grows particularly thick and strong,
 ' increasing in the back, shoulder, or limbs,
 ' according to the particular kind of la-
 ' bour. These are the membranes which,
 ' by inclosing the muscles like sheaths,
 ' are called the vagina, or fascia of the
 ' arm, the leg, the thigh,' &c.

Again, ' These tendons * must be bound

S 2

' firmly

‘ firmly down ; for if they were to rise
 ‘ from the bones, during the actions of the
 ‘ muscles to which they belong, the effect
 ‘ of contraction would be lost, and they
 ‘ would disorder the joint, starting out in a
 ‘ straight line from bone to bone, like a bow
 ‘ string over the arch of a bow. The
 ‘ same inanimate substance still performs
 ‘ this office also ; for the tendons of one
 ‘ muscle often split, to form a sheath or
 ‘ ring for the next ; or their tendons, after
 ‘ taking hold of the bone, spread their
 ‘ expansion out over all the bones, so as to
 ‘ form an entire sheath for the finger and
 ‘ toe ; or there is a wide groove in the
 ‘ bone, which receives the tendons, and it
 ‘ is lined with a cartilage, and with a lu-
 ‘ bricated membrane. The membrane
 ‘ comes off from the slips of the groove,
 ‘ or from corners or edges of the bone,
 ‘ passes over the tendons, so as to form a
 ‘ bridge, or often it forms a longer sheath,
 ‘ as in the fingers, or where the peronei
 ‘ muscles pass behind the ankle, and thus
 ‘ the vagina or sheaths of the tendons are
 ‘ connected with the tendons, periosteum,
 ‘ and

‘ and other modifications of the common cellular membrane.’

Again, ‘ These exterior tendons * are bound down by cross-bands, resembling the annular ligaments of the wrist. The general fascia of the thigh is continued over the knee and down the leg; it is much strengthened at the knee, where it adheres to each point of bone; it descends very thick and strong over the leg, binding and strengthening the tibia-
lis anticus, and exterior muscles. The sheath grows thinner towards the ankle; but where it passes over the joint, it is so remarkably strengthened, by its adhesions to the outer and inner ankles, that it seems to form two distinct cross bands, which going from the point of the outer ankle, across the exterior tendons, to the point of the inner ankle, forms a strong crucial ligament, resembling the annular ligament of the wrist; so that this which is called the *crucial ligament* of the ankle or
‘ foot,

‘ foot, is plainly but a strengthening of
 ‘ the common sheath.’

By this accurate description it appears, that the fascia is increased to its full strength, if not actually created, by the action of the muscles ; and that the crucial ligaments are formed by thickening of the fascia, at the angle made between the foot and the leg. The importance of the fascia, and more particularly of the crucial ligaments, in keeping the muscles in their proper position, so as to obtain the full effect of their contraction, when in action, is well understood. It remains to observe, that as the fascia and ligaments are scarcely discernible in infants, and increase in every sense, in proportion to the increase of action in the foot, if a child born with a club-foot is suffered to grow up with it, the fascia must always be thin, because the action of the muscles decreases, they waste, and therefore that, as well as the whole leg, becomes debilitated ; and as the crucial ligaments are formed by compression of the fascia, by continual action of the foot in walking, there will be no crucial ligament,

1

or

or at least it will scarcely be discernible in a club-foot ; and that, if we reduce a club-foot to the natural form, it will still remain weak, for a time, in proportion to the age of the patient, till the crucial ligaments have acquired strength to support the muscles in their natural action ; therefore it is of as much consequence on this account, as of any circumstance respecting the bones or muscles, that the cure should be undertaken as early in life as possible.

I may now recapitulate that three distinct operations are requisite to cure this deformity ; first, to reduce the bones to their natural position, and natural form, if the patient's age has occasioned any malformation to take place ; secondly, to produce extension of any muscle that has actually been contracted, or seems to be so from the position and consequent inactivity of the foot ; and, thirdly, to keep the foot bound in its natural position, till those muscles which have, from the circumstances of the disease been weak and inactive, perfectly recover their tone and power, when, and when only, the cure will be compleat.

I may

I may likewise be permitted to conclude, from what has been said, that every case of this disease may be perfectly cured, before the patient is three years old ; that after that age, some may soon become incurable ; but that others may remain in a condition to be cured, till the age of ten, eleven, or twelve years old, and even to much later periods of life.

Having said so much on that species of club-foot which takes place before the birth, it may not be thought useless, to make some remarks on those which happen afterwards, and are by no means unfrequent. Two cases I have related, and have known of many others. In doing this, we must suppose the feet to have been in a perfect state ; and, in some cases, from debility, to have lost a part of their powers, which has given rise to deformity that becomes incurable ; in others from palsy, to have lost the whole of their powers, and for want of due assistance, only recovered a part of them, and thus terminated in incurable distortion.

The

The ankle joint has been called one of the strongest in the human body. It may be so, but it is so no longer than while all its parts are in their perfect state ; for while other joints may suffer considerable injury from luxation, &c. without producing lasting mischief, a very slight derangement of any of the numerous bones, ligaments, and muscles of the foot, which are connected with this joint, may, and frequently does give rise to incurable lameness, and has often occasioned the loss of a limb to the incautious sufferer. To have a correct view of the manner in which this happens, and to be upon our guard against the numerous mischiefs that may arise from neglecting seemingly trifling accidents, in children especially, it is necessary again to examine, particularly, the whole of that joint, and parts connected with it ; and by that examination we shall, perhaps, be enabled to form some rational conjectures, on the manner in which the common club-foot takes place before the birth.

It has been commonly supposed, that
T the

the ancle joint owes more to its strength to the form of the bones, than to the strength of the ligaments; and it has been asserted so frequently, without contradiction, that the ancle joint cannot be luxated, without fracturing the head of the tibia or fibula, that it is now almost considered as a demonstrated fact. Yet, perhaps, few things so generally believed, are so totally destitute of foundation; some found it on the peculiar structure of the bones of the leg; others derive it from some passages in Mr. POTT's Treatise on Fractures. As the only passage in Mr. POTT's book which relates to this subject seems to bear a very different interpretation, I shall quote it at length below*; I shall proceed to examine the state of

* ' Whoever will take a view of the leg of a skeleton,
 ' will see, that although the fibula be a very small and
 ' slender bone, and very inconsiderable in strength, when
 ' compared with the tibia, yet the support of the lower
 ' joint of that limb (the ancle) depends so much upon
 ' this slender bone, that without it the body could not be
 ' upheld, nor loco-motion performed, without hazard of
 ' dislocation every moment. The lower extremity of
 ' this

of the leg bones, so far as they are concerned in the ankle joint; and, I believe, shew, that this doctrine is unfounded.

If,

• this bone, which descends considerably below that end
 • of the tibia, is, by strong and inelastic ligaments, firmly
 • connected with the last named bone, and with the astragalus, or that bone of the tarsus which is principally
 • concerned in forming the joint of the ankle. This
 • lower extremity of the fibula has, in its posterior part,
 • a superficial sulcus, for the lodgment and passage of the
 • tendons of the peronei muscles, which are here tied
 • down by strong ligamentous capsulæ, and have their ac-
 • tion so determined from this point or angle, that the
 • smallest degree of variation from it, in consequence of
 • external force, must necessarily have considerable effect
 • on the motions they are designed to execute, and conse-
 • quently distort the foot. Let it also be considered, that
 • upon the due and natural state of the joint of the ankle,
 • that is, upon the exact and proper disposition of the
 • tibia and fibula, both with regard to each other, and to
 • the astragalus, depend the just disposition, and proper
 • action of several other muscles of the foot and toes; such
 • as the gastrocnemii, the tibialis anticus and posticus,
 • the flexor pollicis longus, and the flexor digitorum pedis
 • longus, as must appear demonstrably, to any man who
 • will first dissect, and then attentively consider these
 • parts.

T 2

• If

If, indeed, we are to define luxation to be partial dislocation of a joint by violence only, this opinion may be correct; for it
feldom,

‘ If the tibia and fibula be both broken, they are generally displaced in such a manner, that the inferior extremity, or that connected with the foot, is drawn under that part of the fractured bone which is connected with the knee; making, by this means, a deformed, unequal tumefaction in the fractured part, and rendering the broken limb shorter than it ought to be, or than its fellow: and this is generally the case, let the fracture be in what part of the leg it may.

‘ If the tibia only be broken, and no act of violence, indiscretion, or inadvertence be committed, either on the part of the patient, or of those who conduct him, the limb most commonly preserves its figure and length. The same thing generally happens if the fibula only be broken, in all that part of it which is superior to letter A in the annexed figure (*viz.* about three inches from the bottom) or in any part of it, between its upper extremity, and within two or three inches of its lower end.

‘ I have already said, and it will obviously appear to every one who examines it, that the support of the
body,

feldom, if ever, happens, that such violence is done to the joint, without fracture of the fibula, or that process of the tibia
which

body, and the due and proper use and execution of the office of the joint of the ancle, depend almost entirely on the perpendicular bearing of the tibia upon the astragalus, and on its firm connection with the fibula. If either of these be perverted or prevented, so that the former bone is forced from its just and perpendicular position on the astragalus; or if it be separated by violence, from its connection with the latter, the joint of the ancle will suffer a partial dislocation, internally; which partial dislocation cannot happen without not only a considerable extension, or perhaps laceration of those strong tendinous ligaments, which connect the lower end of the tibia with the astragalus and os calcis, and which constitute, in great measure, the ligamentous strength of the joint of the ancle.

This is the case, when, by leaping or jumping, the fibula breaks in the weak part already mentioned, that is, within two or three inches of its lower extremity. When this happens, the inferior fractured end of the fibula falls inward, toward the tibia, that extremity of the bone which forms the outer ancle is turned somewhat outward and upward, and the tibia having lost its proper support, and not being of itself capable of steadily preserving its true and perpendicular bearing, is forced
off

which forms the inner ancle. But if we are to understand by the term luxation, such derangement of the parts of the ancle joint,

‘ off from the astragalus inwards, by which means the
 ‘ weak burfal, or common ligament of the joint, is vio-
 ‘ lently stretched, if not torn, and the strong ones, which
 ‘ fasten the tibia to the astragalus and os calcis, are always
 ‘ lacerated; thus producing, at the same time, a perfect
 ‘ fracture and a partial dislocation, to which is sometimes
 ‘ added a wound in the integuments, made by the bone
 ‘ at the inner ancle. By this means, and indeed as a ne-
 ‘ cessary consequence, all the tendons which pass behind
 ‘ or under, or are attached to the extremities of the tibia,
 ‘ the fibula, or os calcis, have their natural direction and
 ‘ disposition so altered, that instead of performing their
 ‘ appointed actions, they all contribute to the distortion
 ‘ of the foot, and that by turning it outward and up-
 ‘ ward.

‘ When this accident is accompanied, as it sometimes
 ‘ is, with a wound in the integuments of the inner ancle,
 ‘ and that made by the protrusion of the bone, it not un-
 ‘ frequently ends in a fatal gangrene, unless prevented
 ‘ by timely amputation; though I have several times seen
 ‘ it do very well without. But in its most simple state,
 ‘ unaccompanied with any wound, it is extremely trouble-
 ‘ some to put to rights, still more so to keep it in order,
 ‘ and unless managed with address and skill, is very fre-
 ‘ quently

joint, whatever may be the occasion of it, the above-mentioned opinion is by no means true; for we frequently see distortions of the

• quently productive both of lameness and deformity ever
• after.

• After what has been said, a farther explanation
• why this is so, is unnecessary; whoever will take a cursory
• view of the disposition of the parts, will see, that it must
• be so. By the fracture of the fibula, the dilatation of
• the burfal ligament of the joint, and the rupture of those
• which should tie the end of the tibia firmly to the
• astragalus, and os calcis, the perpendicular bearing of
• the tibia on the astragalus is lost, and the foot becomes
• distorted. By this distortion, the direction and action
• of all the muscles already recited are so altered, that it
• becomes (in the usual way of treating this case) a
• difficult matter to reduce this joint, and the support of
• the fibula being gone, a more difficult one to keep it in
• its place, after reduction. If it be attempted with
• compress and strict bandage, the consequence is often
• very troublesome, as well as painful ulceration of the
• inner ankle, which very ulceration becomes itself a
• reason, why such kind of pressure can be no longer
• continued; and if the bone be not kept in its place,
• the lameness and deformity are such, as to be very fa-
• tiguig to the patient, and to oblige him to wear a
• shoe

wards, and by continual struggles to regain its natural situation, the strength of the foot is brought to act upon the weakest part of the bones of the leg, which bend gradually, and at last are folded into the position they are found in at the birth; the foot being flattened more or less, in proportion to the degree of compression it has suffered, and the length of time it has been confined. In the cases I saw*, the arch of the foot was nearly obliterated, and the whole foot nearly as flat as a common hand.

On the inside, the astragalus is secured in its natural situation, by that process of the tibia which forms the inner angle. This, as I have already observed, does not descend

* I have seen three of these cases. One was sent me by Mr. HOOPER, from the Mary-le bone Infirmary: this child died a few days after I first saw it, and before I could make any attempt to relieve it. The other two were brought to me during one of my visits to Ireland, and when I was on the point of leaving that country, so that I could make no attempt to relieve them; but am persuaded, if they could have been placed under my care, they might have been cured.

descend so near the ground as the fibula, by more than half an inch in an adult foot, and therefore the astragalus is much less securely fixed in its place on this side, than on the other. If, therefore, dislocation, or violent luxation of the ankle joint, so as to turn the foot inwards, does take place, it may frequently happen, that this process of the tibia may be fractured: but, as the foot is capable of moving sideways, as well as suffering the leg to move directly forwards over it, and the process of the tibia does not impede its motion to the inside, so completely as the fibula does to the outside, it may frequently be violently luxated if not actually dislocated in this direction, without fracture of the tibia.

It is from this facility of the foot to turn inwards, and to some peculiarity in the form of the bones of the leg, that the origin of the common club-foot is to be attributed. It is well known, that the leg bones of young children, for some time after the birth, are not strait; they are curved outwardly, from the position in

which the foetus is naturally laid, and that curve disappears as the child grows up. But in every case of club-foot that has come under my observation, the bones of the leg have been remarkably straight; so much so, as to excite the attention of nurses, &c. who are in the habit of seeing children, and certainly would not have made the observation, if the fact did not exist. Whether this peculiar straightness of the leg bones does, or does not account for the origin of this disease, may be understood from the following considerations :

If we reflect on the position of the foetus in utero, we shall see that the outside of the leg and foot, while in that position, describes a segment of a circle, or at least of an ellipsis; and from the form of the impregnated uterus, this elliptical tendency of the legs and feet, as well as of the whole foetus, is inevitable. Now, in the ordinary course of things, if a straight line was drawn from the knee of the foetus, the whole leg and foot would be found to deviate from that line to a certain degree,
and

and form a regular section of a curve ; but if, from whatever cause, the bone of that leg is perfectly straight in its whole length, all the curve, which is necessary to allow the foetus to lie in its situation, instead of being equally divided through the whole length of the leg and foot, is confined to the foot only, which, in consequence, forms an acute angle with respect to the leg. It is more acute, in proportion to the degree of compression it has sustained, and the length of time it has been confined in that situation : and as the foot is composed of numerous small bones, which in the foetus, are loosely connected together, in consequence of this accident, it easily assumes those forms we see in such variety in incipient club-foot.

Thus we see the connection between the bones which form the ankle joint is remarkably strong ; strong enough to bear a continuation of the most violent exertion, so long as all the parts are in perfection ; but when any derangement in the muscular action takes place, the importance of each part to the well being of the whole

is so great, that a very slight sprain, or even accidents more trifling, may give rise to lameness, and incurable deformity.

I have already explained, why the flexor muscles of the foot are so much stronger than their antagonists, the extensors: and it results from this fact, that where general debility of the limb takes place, from any cause, its effects will be first and most sensibly felt in the weakest part. For this reason, if a child, after it has walked, becomes debilitated by illness, by over exercise, or by any accident, so much of that weakness as falls upon the foot and leg, will most affect the outside of them: the peronei muscles will be less able to support the foot properly; they will soon give way, and, by repetition of this failure, be continually strained, till at last they will lose all power of action. The bones, from the circumstances of their connection with each other, will favor and increase this defect, - till themselves feel the effect of it; their relative position is altered, and by negligence and time, they will at last acquire all the deformity

deformity that takes place in (if I may so call it) the natural club-foot.

This will most frequently happen from weakness, from violent sprains, or from other violent accidents; because where such accidents happen, their effects naturally fall on the weakest parts. But there are cases the reverse of all this; cases, where the muscles inside the leg, which are much the strongest, become too weak to support the body under its own pressure; where the bones, which are so well secured as to be commonly thought incapable of dislocation on the outside the joint, without being fractured, fall gradually into a condition similar to what would be produced by luxation. This may, on some occasions, be the effect of mere debility; but it is more frequently the produce of negligence, or of gross absurdity in the management of children; a conjecture which derives much strength from the fact, that these defects are most frequent in females of the middling and higher classes

classes of life. A young lady learns to dance ; it is proper that she should do so, as few actions are more graceful than that of turning out the toes, &c. as she walks : but she is perhaps obstinate or negligent, and will not do so ; she is, therefore, made to stand in the stocks, with her feet turned out as much as possible. The anatomist must see, that the effect of this practice is by twisting the foot outwards, to force the astragalus against the end of the fibula, by the resistance of which the ligaments which connect the bones of the foot and ankle joint are weakened ; the muscles are, in consequence, strained ; and at last permanent debility, and often deformity, is produced. If this does not happen, or if she is made to sit in the stocks, another defect, at least as bad, may be produced. By turning the feet outwards in this manner, the knees are inevitably bent inwards ; and very considerable distortion may, in this way, be produced. If the habit of turning out the feet must be acquired, it will be best done by the practice of
of

of dancing or marching, under the inspection of proper teachers. What is so learnt, will add strength to the limbs, as well as grace to their motions; but whatever is done by such machinery, which is too generally and improperly used, will generally produce debility, and too often deformity.

When a leg becomes paralytic, all its powers are lost; it becomes flaccid, and may be turned in any direction that does not exceed the extent of its natural motions; but when the paralytic affection is removed, it recovers its powers by degrees; and as the flexor muscles of the foot are much stronger than the extensors, they have acquired a considerable degree of power, before the power of the latter is sensibly restored; and as a patient in this situation begins, or at least attempts to walk, as soon as possible, and long before the natural power of all the muscles is restored, the obvious effect is, that a halting, imperfect kind of motion takes place, in consequence of the defective action of the muscles of the foot; and, through

the rest of his life, he drags a debilitated, and almost useless limb after him; or obstinate contraction of the flexor muscles, and consequent deformity of the foot takes place, which, in many of these cases at least, might be prevented, by a very moderate degree of attention, as the methods by which the above-mentioned diseases may be obviated, are deducible from the same general principles, by the application of which I have been uniformly successful in curing the common club-foot. I trust I shall be excused for having inserted these brief remarks here, though they do by no means include all that can be said on the subject. The conclusions I wish to draw from them are, that in young children, very trifling accidents may, if neglected, produce incurable deformity; and that moderate attention to such accidents, which are too frequently called only a little weakness, that will go off of itself, will prevent any such consequences from arising: and that when paralytic patients are recovering from the effects of that disease, if the necessary attention is paid to keep their legs and feet in their

their natural positions, at the same time that the original disease is attended to, many would perfectly recover the use of their limbs, who, for want of mechanical assistance in due time, remain cripples for life.

C A S E . XVI.

Miss —, aged five years, had but indifferent health, and been neglected by her nurse. The knees were both bending inwards, in the common way. This gradually increased, till the bones of the leg, about three inches below the knee, began likewise to bend: when her knees were close together, the inside of the feet were eight inches apart. The instruments I have already described were perfectly adapted, and left to the management of the nurse in the country, who totally neglected them. When this was discovered, she was taken home, and better taken care of; but the instruments were never applied in the night,

notwithstanding I repeatedly pressed the importance of incessant application, in a case so bad as this. The consequence has been, that at the end of two years she is *almost* well, and continues to wear the instruments in the way she has already done; but I have no doubt, on comparing this with other cases that have fallen under my observation, that if the whole plan proposed had been properly followed, she would have been quite well in half the time that has been already employed in the cure.

C A S E XVII.

MASTER —, aged two years and a half, had the right knee much bent, like the preceding case; but the bones of the leg were not affected. By the recommendation of Doctor CLARKE, he was put under my care. The instruments I usually apply were adapted to both legs, as there was reason to fear the left would bend, if the right leg only had been supported; and as it was not thought necessary to keep
them

them continually in use, they were only worn in the day time. In six months, the knees were both perfectly straight; but it was determined to use the instruments some time longer, to prevent a relapse. There can be no doubt, that if the instruments had been continually used, this patient would have been well in much less time; but as the distortion was not originally of the worst kind, and the patient's friends were desirous that he should avoid the inconvenience of wearing the instruments at night, even at the expence of being long under cure, the additional time can hardly be regretted, since he was so soon and so completely cured.

C A S E XVIII.

MASTER —, had always been a very delicate child, and at the age of two years, his knees were so much bent inwards, that when they were close together; his feet were five inches apart, and he was scarcely able to walk at all. By the application of the
in-

instruments, properly adapted, and under the care of a nurse in the country, where I had few opportunities of seeing him, he got perfectly well in about fourteen months.

C A S E XIX.

Miss —, aged two years and a half, was remarkably small and delicate, in every respect. Her knees began to bend from the time she first walked, and this debility encreased so much, that when I first saw her she could scarcely walk at all, and when she stood, her feet were six inches apart, while her knees were close together. By steady perseverance in every part of the plan recommended, her knees were perfectly straight at the end of six months. She had become very active, and more healthy ; but as there was reason to fear she might relapse, if the instruments were too soon taken away, she was directed to continue to use them some time longer.

C A S E

C A S E XX.

Miss —, aged three years, and healthy in every respect, had the left knee very much bent inwards, but without distortion of the bones. There was much reason to believe this deformity was occasioned by the indolence of a careless nurse-maid, who constantly carried the child swinging over her left arm. By experience in other cases, I was justified in advising the application of instruments to both legs, in this ; but it was not submitted to, and that which was applied to the distorted leg, was so carelessly treated, and scarcely attended to at all, that no benefit was derived from it, till the increasing distortion proved the necessity of perseverance.

Still the instrument was only applied to one leg, and that only in the day time. At the end of fourteen months, the leg, originally distorted, had become almost straight, and that which at first was quite straight, is now a little bent, so that now
 she

she has both knees in some degree bent ; but the parents are so well satisfied with her situation, that the instrument is laid aside.

There can be no doubt, that if the plan I advised had been regularly followed, this child would have been perfectly cured ; but as the parents have chosen to act, they have, perhaps, only laid a foundation for future deformity.

C A S E XXI.

Miss —, aged five years, and remarkably small of her age, had always very bad health, and from some cause that was not explained to me, had lost both the power and inclination to walk, for some time. When she began to recover, her endeavours to walk caused her knees to bend, for which reason she was then not permitted to stand on her legs, till proper assistance was giving. After the instruments were properly adapted, she was advised to
try

try sea bathing, for the benefit of her general health. In less than two months, I was requested to make some necessary alterations in the instruments, and informed, she was then able to take much exercise, was become active, more healthy, and no doubt was entertained, by those who had seen the alteration already produced, that she would perfectly recover.

C A S E XXII.

MASTER —, six years of age, had both knees much bent inwards. His parents had been advised to get what are commonly called leg-irons for him. These were so improperly constructed, that the tops of them rested against the femur, about two inches above the knee joint. By the sedulous use of these ingenious instruments, for about twelve months, the thigh bones became bent, at those parts that were pressed upon by the tops of the irons, and had something the appearance of bones that had been broke and badly set, and the knees were more bent than
Y when

when the irons were first applied. By the application of my instruments for six months, the distortion of the knees was removed; but the incurvation of the bones still remains, though it is probable that, by perseverance in the same plan, even that deformity will be cured.

C A S E XXIII.

Miss —, aged two years and a half, remarkably small of her age, apparently healthy, and very active, had both the knees much bent inwards. As there was no other circumstance to account for this distortion, and she was able to go alone at the age of ten months, it was probably occasioned by putting her so very early on her feet. The necessary instruments were applied, and sedulously used, by which means she was enabled to walk with tolerable ease. She was ordered to the sea-side, where she bathed constantly, and in something more than six months, by perseverance in the plan recommended, her legs became perfectly straight.

C A S E XXIV.

Miss —, aged twenty-two years, had had both the knees very much bent inwards from her infancy ; so much, as very sensibly to impede her walking. In consequence of my advice, she determined to try what alteration could be produced by those instruments, which I had found so effectual in younger patients. They were properly adapted to her case, and sedulously applied for several months. The curvature at the knees has been much diminished ; she finds she can walk so much more, and with so much more ease with, than she could possibly do without them, and to use her own expression, she finds them such a comfortable support to her, that she has determined to persevere in using them, for sake of the temporary support she receives, and not without hopes of obtaining a perfect cure.

C A S E XXV.

Miss —, aged nineteen, had, in her infancy, had some distortion of the legs, of which I could obtain no authentic and certain account. The best I could get was, that her family lived a considerable distance from London, and when the distortion in her legs was perceived, were advised to procure leg-irons for her, which they did. A difference of opinion arose, with respect to the application of them ; one person insisting that they should be placed on the outside, another that they should be on the inside the legs. In this dilemma, it was determined to try them on one side, and if that did no good, to move them to the other side the legs. This plan was actually executed ; but, unfortunately, the legs got worse, on whichever side the irons were applied, therefore they were entirely laid aside.

At the time I saw her, the toes were pointing inwards, considering their situation
relative

relative to the feet. The knees were bending considerably outwards; but all the bones, both of the legs and thighs, were perfectly straight. She was healthy, tall, and inclined to be corpulent, and in consequence of this peculiar position of the legs, &c. was incapable of walking more than half a mile at once, without being quite fatigued; complained of extreme pains on the outside of her knees and ancles, and was therefore prevented from taking much exercise, otherwise than in a carriage. From the circumstances of her case, it is evident that she must either become more helpless, by declining all attempts to walk, or by walking, increase the distortion of the knees and ancles, and thus ultimately increase her debility. Under these circumstances, any assistance that could alleviate any of the inconveniences this patient laboured under, became an object of consequence to her. The plan I proposed, was either to attempt a cure, by endeavouring to restore the limbs to their natural position and action, or merely to support them in their present situation, so

as

as to enable her to take proper exercise, with as little inconvenience as possible. The instruments applied were calculated to produce both these effects, if they were attainable; and I have the satisfaction to say, she has been materially served by them. She has now worn them more than a year, and is now able to walk four miles at a time, without being much fatigued. In short (I use her own words) she is so much more active and comfortable to herself with, than she should be without them, that she is determined never to lay them aside, unless it should happen that they perfectly restore her legs to their natural state; and thus render the farther use of them unnecessary.

By the ordinary modes of treatment, nothing could have been done in the two preceding cases, except, perhaps, applying heavy, unwieldy leg-irons, which would encumber, at least as much as they would assist the wearer: but by the instruments I have applied, a positive increase of the power of walking has been produced, to a very great degree;
and

and though in one sense, it may be said to be only temporary, it is still a temporary good, that may be continued to any length of time, at the will of the patient. But as there is no physical impossibility to prevent the form and strength of the limbs, in both cases, from being perfectly restored, it is surely an improvement of consequence, in the treatment of such diseases, that can produce so much temporary benefit, and afford well founded hopes of permanent relief, to persons who could obtain no benefit whatever from any other method of cure.

C A S E XXVI.

Miss —, aged two years, was recommended by Mr. CRUIKSHANK to me, for assistance. She had long been under his care for complaints, which it is needless to particularise; but, in addition to them, she was incapable of supporting or directing her head in any particular position; it always fell backwards, and lay almost motionless on her shoulders. As there was reason to suppose this defect would increase,
and

and produce other deformities, it was determined to support her head by my spinal machine, which was done for two years before the defect disappeared.

During my attendance on this case, I remarked a peculiar defect in her manner of walking. She seemed as if the tendo achilles in each leg was suddenly contracted, so as sometimes to force her to walk on her toes, while, at others, she could walk flat on her feet. I recommended some precautions, which if duly followed, might have prevented the ill consequences of this defect; but I believe they were not complied with.

Several months afterwards, I was called to assist this child. The tendo achilles of one leg was much, and rigidly contracted; the toes were drawn inwards, and she walked on the outside of her foot, which had assumed much of the form and appearance of the common club-foot. I adapted proper instruments, by means of which, in a few months, this foot perfectly recovered

covered its form, position, and use. Some time afterwards, the other foot was affected in the same way, and was perfectly recovered by the same treatment.

Without pretending to ascertain the predisposing cause of this patient's distortions, I may be permitted to observe, that if the precautions I recommended (and which perhaps were thought unnecessary) had been followed, the feet would not have been distorted, as they afterwards were ; and if they had been farther neglected, they would have terminated in two club-feet, as completely as that of Case XIV, page 48.

C A S E XXVIII.

Miss —, aged four years, had very indifferent health, with much enlargement of the bones of the wrists, ancles, &c. besides other symptoms of rachitis, and the knees so much bent inwards, that she could not walk with ease.

Z

Mr.

legs diverge ; or the knees diverge, and the feet approach to each other. All these distortions may be considered, either as simple relaxation of the ligaments and tendons, on one side the joint, as in very young children, when they are recent, or as relaxation on one side, and contraction on the other side the joint, as in those who have had the complaint long, and grown perhaps to maturity with it. In whichever point of view it may be considered, I have shewn it may be easily remedied ; and am, perhaps, justified in believing it is, in no case, incurable.

Those who are prone to wonder, and those who are determined to be sceptical, may be equally surprized when told, a distortion of the knees, to such an extent as to place the feet at the distance of seven or eight inches from each other, may be perfectly cured in a few months ; but that surprize may be diminished, by an accurate examination of the facts, which may be thus demonstrated.

Suppose

Suppose a perpendicular column, eighteen inches high (which is nearly the height of the leg and thigh of a child about three years old) and two inches in diameter, divided in half, horizontally. While these parts lie directly upon each other, the whole would be perpendicular ; but if, by any accident, they should be separated from each other on one side, and on the other remain in contact, and if, by any means the upper half retained its upright situation, the lower would diverge from its perpendicular situation, in proportion to its length, and the distance to which the separated parts are removed from each other ; and if there were two such divided columns, diverging from each other in opposite directions, the distance between the lower ends would be doubled, and a considerable separation between them produced, by a very trifling alteration in the relative situation of those parts, which actually occasion the whole deviation from the natural form. This is, nearly, the situation of the legs of a child, distorted by the knees bending inwards ; and it is,

5

hence,

hence, easily seen, that a very trifling relaxation of the ligaments of the knee-joint, and the tendons connected with them, may produce very considerable deformity of this kind.

In such distortions, when recent, two operations are requisite to effect a cure, *viz.* to replace the bones in their natural relative position; and to retain them there, till the ligaments and tendons connected with the knee-joint, have recovered their natural power of supporting the weight of the body properly on the legs.

In recent cases, where the distortion has been brought on suddenly, or at least, quickly, by debility, the reduction will be easily effected; for the same debilitated state of the parts, which have occasioned them to give way, will not oppose any obstacle to any rational attempts to return the legs to their natural form, and then time, with the assistance of cold baths, &c. will enable them to recover, perfectly, their natural functions. But when, from length
of

of time the disease has existed, age of the patient, or any other circumstance, the parts have become rigid or contracted, it will require considerable caution to reduce them to their natural position ; but still it is possible to do so.

As the degree of relaxation requisite to produce this distortion is not great, so the degree of rigidity or contraction necessary to retain it in its worst form, is not greater than the relaxation which occasioned it. From this view of the subject, and from what we know of the effects of mechanical action upon tendinous contractions, it is not too much to conclude, there are few, if any cases, even in adults, that are absolutely incurable : and from a knowledge that the mode of treatment I have invented may be adopted to every possible case, it would, perhaps, not be unwarrantable to conclude, that every case, which in its nature is not incurable, may be cured by it. But I shall, at present, confine myself to that class of patients, about which there can be little difference of opinion. I have related

which have a strong claim to our attention.

Whenever there is distortion in the legs, or elsewhere, the patient will always sleep in a position that favors, and therefore has a strong tendency to increase the deformity. If the instruments, of whatever description they may be that are used, during the day, to counteract the distortion, are capable of producing that effect, if their action is merely limited to restrain the progress of the deformity, it must be performed by compression on the knees, the moment, therefore, these are removed, and the patient lain in bed, the knees will fall, more or less, into their deformed position, and by this means, great part of the benefit that had been derived from them in the day, will be counteracted by the relaxed position of the parts during the night ; but if any rational attempt is made, during the night, to continue the restraint that they are kept under in the day, the cure will be effected in less than half the time it will require

require to perform it, if the same means are employed during the day only.

If this argument is allowed to be well founded, when applied to the common leg-irons, it is much more so, when applied to the instruments I have invented for curing these distortions. By them, a constant uniform action may be kept up, so long as is necessary to effect the cure. If a cure is to be effected by this action, there can be no doubt, that the more constantly, the action is kept up, the sooner its ultimate effect will be produced. This is so evident, that farther arguments will be deemed unnecessary to prove, that the instruments described in the annexed Specification, for curing distortions in the knees of children, or others, ought to be constantly and regularly applied, during the night, as well as the day, till the cure is completed.

Two objections, however, have been made, with some plausibility, to this practice; first, the great uneasiness it must occasion to the patient; and, secondly, that

some cases are too slight to require this treatment.

To the first it may be answered, that whatever we are not accustomed to is unpleasant, till habit has reconciled us to it; therefore a child may be restless and uneasy, for the first night or two after it is put into this situation, but will not, afterwards, feel the least inconvenience or uneasiness from sleeping in these instruments. To the second it must be replied, that I have considered the whole subject in one general point of view, and stated, *generally*, what appears to me the best mode of treatment. It must be determined, in practice, by the circumstances of particular cases, what exceptions shall be made to the general rule.

If I were required to lay down a rule on this subject, it should be nearly in the following way.—In very young children, when the distortion at the knee is small, when the patient's health is so indifferent as to be injured by want of rest, even for two or three nights, the instruments should
only

only be used in the day time; since it will be better to protract the cure for some time, than to take the chance of such evils by accelerating it. Even in cases where there is no reason to dread such effects, if the over tenderness of parents should render them unwilling to subject their children to such treatment, no very cogent reasons can be given for insisting upon it, as it is a question of prudence, which they alone have a right to decide; and if they chuse that a longer time should be employed in effecting a cure, rather than adopt the most expeditious mode, we may, without impropriety, pursue that plan. But in very bad cases, where there is much contraction, or at least rigidity to overcome, where the distortion is of long standing, and the patient, perhaps, farther advanced in life, the most rigid, but indispensably necessary plan must be pursued, by keeping up the necessary action continually, by constantly using the necessary instruments, both day and night. I have seen many cases cured, by adopting this practice, that never would have been benefitted in any other way; and
I can-

I cannot hesitate to say, that in all such, the question, whether the instruments shall be kept in continual use, during the time of performing the cure, or not, is the same as, whether the patient shall be cured by, or derive no advantage from the use of them.

C A S E XXVIII.

IN the month of April, I was desired by Mr. KNIGHT to attend the son of a person of high rank. Dr. UNDERWOOD and Mr. KNIGHT were present. The child was two years and an half old, was remarkably strong and healthy, but had the bones of the legs bending outwards, and the toes considerably turned in, in consequence of the curve. *Fig. 1* and *Fig. 2*, annexed to the Specification, though not drawn from this case, will convey a very correct idea of it.

To remedy these defects, I proposed to apply the instruments described in the Specification,

cification, with an addition that would enable me to place the feet in any situation that might be requisite, and vary that situation at pleasure. This proposal was approved of both by Dr. U. and Mr. K., and therefore was carried into execution:

As the distortion was not of the very worst description, it was not thought advisable to keep the instruments continually in use, they were therefore taken off at night, and applied in the morning. As this mode of treatment did not require continual attendance, and as, from the rank of the patient, we were certain that every direction given would be implicitly obeyed, it was only requisite for me to see him occasionally, to make such alterations as were necessary in the progress of the cure.

This case went on as well as could be wished. The instruments did not, in the least, incumber or prevent the patient from taking his usual exercise, and the legs straightened so quickly, that in the beginning of September, when Dr. UNDERWOOD
and

and Mr. KNIGHT were desired to examine the child, they were of opinion, that he was perfectly cured, and therefore directed all the instruments to be laid aside.

As incurvation of bones of the legs has justly been held to be incurable by any means before known, and as this was the first case in which I had occasion to try this mode of treatment, which I have invented, it was peculiarly gratifying to me, that it should be tried so fairly, under the observation of Dr. UNDERWOOD and Mr. KNIGHT, as their opinions on the subject will be received as sufficient proofs of its efficacy.

C A S E XXIX.

Soon after I was called to the above case, I was consulted by Mr. DELCOUR of Rathbone Place, whose daughter was in a similar situation. The curve of the legs was exactly like it; but the child by no means so healthy. The promising appearance

ance of success in the former induced me to try the same means to effect a cure in this case, and with equal reason to expect a favorable event. For four months that she wore them, the legs improved so fast, that it was soon intended to lay the instruments aside, as useless, when a sudden alteration in the state of her health made it necessary to discontinue them, before the cure was complete. This ill state of health continues; but it is proposed, as soon as possible, to resume the application of the instruments; and there is no doubt, from what has already been done, that the success will be complete.

As the cure of this case is, at present, imperfect, and as I wish to establish every fact relative to this hitherto incurable deformity, on the firmest basis, I have requested Mr. DELCOUR to give me his opinion, which will be found to confirm the facts I have already stated.

‘ Mr. DELCOUR presents compliments to
 ‘ Mr. SHELDRAKE, has received the con-
 ‘ tinuation of his observations, and finds

B b

‘ that

‘ that part of them which are relative to
‘ his daughter’s case, is exactly consistent
‘ with the strictest truth.’

‘ Rathbone Place,

‘ Sept. 4, 1797.

C A S E XXX.

In May, 1797, I was consulted by a Lady, whose daughter was in a situation similar to the two preceding. She was two years and a half old, very delicate health, and had the bones of both legs bending directly outwards. The same instruments were applied as in the former case ; but as an objection was made to the continued use of them, they were only applied in the day time. By this imperfect mode of application, I was rather surprized to find they were visibly better in three weeks, and at the end of four months were perfectly recovered.

C A S E XXXL

During my stay in Dublin in 1796, a Lady applied to me with her daughter, in
the

the same situation as the last described case. The same kind of instruments were adapted, and proper instructions given for the use of them. The child was frequently brought for me to examine her legs; and during the short period of my stay, the amendment was so quick and so visible to every one, that no doubt could be entertained of her speedy and perfect recovery. I have since been informed, that in less than six months she was perfectly cured.

REMARKS

On Incurvation of Bones of the Leg.

ALTHOUGH it is certain, that the form of bones, in young children, may be altered by accident or disease, and it may be justly concluded from this fact, that it is possible, by counter alterations, to remove the effects of such diseases, yet it is perfectly notorious, that no rational method

of curing these distortions has been practised. Under these circumstances, it is with much satisfaction I am enabled to announce a method that, with due perseverance, promises to be successful, in every case where success is possible. The preceding cases prove, that it has been successful when fairly tried, and the demonstrations in the annexed specification will explain the principles, by the application of which the cure of these distortions have been effected ; so that it is only necessary, in this place, to add such remarks on the causes of this disease, as could not, with propriety, be included in the specification.

It is a fact, generally known to anatomists, that the central part of the cylindrical bones is first ossified, and, in young children, is of a more solid texture than the other parts of the same bones : and it has been observed, and may be fairly accounted for, from the preceding fact, that when incurvation on the bones of the leg takes place, the central part of them is least affected.

affected. They generally bend towards the lower part ; and it happens, not unfrequently, that when such distortions are long neglected, they proceed so far as to let the bones of the leg, when moved sideways, touch the ground. I have, in one case of the direct curve, seen the lower part of the leg so bent, as to lie in contact with the upper part of the foot. When a disease of this nature is suffered to go to such extent, it is perhaps not reasonable, for many reasons, to expect a perfect cure : if any thing can be done to alleviate the most distressing effects, a point of consequence to the patient is gained ; and if they are too far gone, even for this degree of mitigation, notices of such cases may serve as reasons to caution the negligent, and prevent them, by carelessness, from suffering their children to sink into similar situations.

The little attention that has been given to these diseases, by professional men, has left the treatment of them too much in the hands of the weak and the ignorant of various descriptions ; and the way in which
such

such people must talk on a subject they cannot understand, has given rise to vague and unsatisfactory opinions, concerning the facts of the disease and the circumstances that have produced them. Thus we have been told, the weight of the body occasions the legs to bend under it; and those who have strength of imagination enough to think they are sure of this, are willing to believe, the weight of the body is the only circumstance deserving notice, either in preventing or in curing distortions of the legs. With them, peculiarity of formation, irregular muscular action, or ill habits of various kinds, are of no importance, though there is abundant reason to believe, that these principally contribute to the formation of this disease, or, at least, have a strong tendency to deprive the weight of the body, and setting children too soon on their legs, of the reputation they have acquired for being the sole cause of all this class of distortions in the legs of young children.

In speaking of the predisposing causes of
club-

club-feet, I have endeavoured to explain, that from the position of the fœtus in utero, the legs of children, from the thigh downwards, assume a particular curve, which in the ordinary course, disappears as the child grows up. I have, at this time, a child under my care, that was born with one club-foot. The bones of that leg seem as strait as they could be laid by a rule; the bones of the other are curved in the natural way. Here is a different conformation of the two legs of this child; and it must be allowed, that whichever we may chuse to call the natural form, the other is a peculiar original formation, tending to deformity. The extreme straightness of the leg, I imagine, for reasons already given, occasioned the distortion of the foot; and if it deviated a little farther from its natural form, the leg itself might have been distorted: on the other hand, if the opposite leg had been a little more curved, than the legs of children *commonly* are at the birth, that peculiarity might have laid the foundation of a deformity, like that at present under consideration.

If

If the force with which the muscles of the leg and foot are capable of acting, be considered, we shall be able to deduce the origin, or at least the increase of some distortions of the legs, from peculiar actions of those muscles; for example, that in which the bones of the leg bend directly forwards. In all cases of this kind that I have seen, the tendo achilles has been much more rigid than in the well-formed leg; the calf of the leg very thin; and the gastrocnemii muscles almost incapable of acting. I might, perhaps, be justified in attributing the origin of this distortion to the action of these muscles operating upon the bones, under peculiar circumstances; but I shall, at least, be permitted to observe, that after the distortion has taken place, the contraction of the gastrocnemii muscles, and tendo achilles, must, from their position and action, perpetually tend to increase the curve of the bones of the leg; and this being once admitted, certainly confirms the former conjecture, that the action of these muscles operating upon the weakest parts of the soft bones, may, either
of

of itself, or in conjunction with other causes, produce many of these deformities.

I have said thus much, in hopes of making it appear, that other causes, besides pressure from weight of the body, may produce these distortions. It is, however, by no means my intention to say, that the gravitating power of the body is of no importance in the formation of these diseases; on the contrary, I am persuaded, that as a secondary cause, it is concerned in them all; for if we consider the legs as columns intended to bear the weight of the body, and that, by whatever accident their form is so altered, as to diminish their natural strength, the pressure from the weight begins to act in depressing them, and continues, with accelerated force, till, by artificial means, the farther progress is prevented.

If the principles I have laid down for the treatment of these distortions be investigated, it will be found that I begin by supporting the legs in their present condition:

C c

dition : the acting power is then placed on the most solid part of the leg bones, which form the basis from which it acts ; the bandages are then fastened upon the weaker extremities, which brings the springs into action, and the re-action of which is, by this means, constantly exerted in correcting the curve ; by this means every possible advantage is obtained in the application, and every possible benefit may be expected in the event.

In this, more than in any other class of distortions, there is occasion for unremitting perseverance. It is not the question, whether a debilitated joint shall be enabled to bear the weight of the body ; but whether a bone that is bent out of, shall be restored to its natural shape. In canvassing the former subject, it may be disputed, whether any support is necessary, except when the patient is upon his legs ; but, in the latter, it cannot be denied, that the curve having once taken place, must remain, in whatever situation the patient may be placed, till the proper means are applied

applied to eradicate it: and that it will be eradicated early, in proportion to the constancy with which the means are applied; is a self-evident proposition.

SPECIFICATION
OF A PATENT, &c.

‘ TO ALL TO WHOM THESE PRESENTS
‘ SHALL COME, I, TIMOTHY SHELDRAKE, the
‘ younger, of No. 50, in the Strand, in the
‘ county of Middlesex, Truss-maker, do fend
‘ greeting: Whereas his most Excellent Ma-
‘ jesty, King George the Third, by his letters
‘ patent, under the great seal of Great
‘ Britain, bearing date at Westminster

did give
‘ and grant unto me, the said TIMOTHY
‘ SHELDRAKE, my executors, administra-
‘ tors, and assigns, his special licence, sole
‘ privilege, and authority, that I, the said

‘ **TIMOTHY SHELDRAKE**, my executors, ad-
 ‘ ministrators, and assigns, during the term
 ‘ of years therein expressed, should and
 ‘ lawfully might make, use, exercise, and
 ‘ vend, within England, Wales, and the
 ‘ town of Berwick upon Tweed, my new
 ‘ invented method of curing all the de-
 ‘ formities of children, or others, which
 ‘ arise from, or are connected with dis-
 ‘ tortion in the form or combination of
 ‘ bones that exist in the deformed part;
 ‘ in which letters patent there is contained
 ‘ a proviso, obliging me, the said **TIMOTHY**
 ‘ **SHELDRAKE**, under my hand and seal, to
 ‘ cause a particular description of the na-
 ‘ ture of my said invention, and in what
 ‘ manner the same is to be performed, to
 ‘ be inrolled in His Majesty’s High Court
 ‘ of Chancery, within one calendar month
 ‘ next and immediately after the date of
 ‘ the said recited letters patent, as in and
 ‘ by the same (relation being thereunto
 ‘ had) may more fully and at large appear.
 ‘ Now know ye, That in compliance with
 ‘ the said proviso, I, the said **TIMOTHY**
 ‘ **SHELDRAKE**, do declare, that my said in-
 ‘ vention

• vention is defined and described as fol-
 • lows; that is to say, My new invented
 • method of curing all deformities, or dis-
 • tortions in the legs, feet, arms, or other
 • parts of children, or others, (provided
 • they are not in their nature incurable)
 • whether such deformities or distortions
 • arise from, or are connected with the
 • improper form of one or more bone or
 • bones, or by the improper combination
 • of two or more bones, or by the impro-
 • per form, and improper combination of
 • any number of bones that exist in the
 • deformed or distorted part, is effected by
 • the continual, repeated, and varied ap-
 • plication of a spring or springs, to be
 • constructed, adapted, and applied with
 • bandages, and by instruments, in such
 • manner, that the spring or springs which
 • constitute the efficient part of such ap-
 • plications shall be constantly acting, to
 • correct the disease, and shall have their
 • powers varied, modified, and increased,
 • as circumstances shall require, so as to
 • diminish the deformities or distortions, by
 • degrees, until they are finally eradicated.

' This is the general nature of my inven-
 ' tion, a more particular description of it,
 ' and the manner in which it is to be per-
 ' formed, I will now state, in various in-
 ' stances, as particularly and distinctly as
 ' the nature thereof will admit. In the
 ' first place, I shall illustrate the method
 ' of treating those distortions or deformi-
 ' ties, which arise from the improper form
 ' of bones, by explaining the treatment of
 ' curvature in bones of the leg, which is
 ' one of the most frequent diseases of that
 ' description; whether the bones bend in-
 ' wards, outwards, or forwards, is of no
 ' consequence, as the principle on which
 ' the remedy is to be applied is the same in
 ' all.—Figures 1 and 2, hereunto annexed,
 ' represent a child's leg bending outwards;
 ' the lines marked with the letters *a, b, c.*
 ' in both figures, represent the curved
 ' spring, intended to correct this deformity.
 ' It is evident, that if this spring is, by
 ' bandage or otherwise, at *a. d.* and *c. e.* in
 ' figure 1, or *b. d.* in figure 2, brought
 ' into contact with the leg, the inside of
 ' the knee as at *d.* in figure 1, and *a.* in
 ' figure

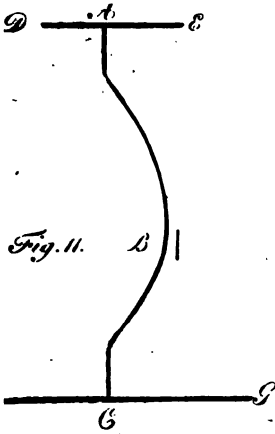


Fig. 13.

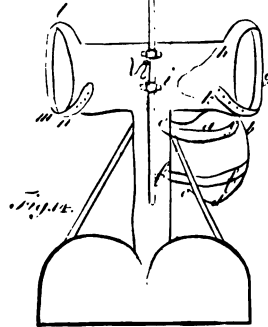
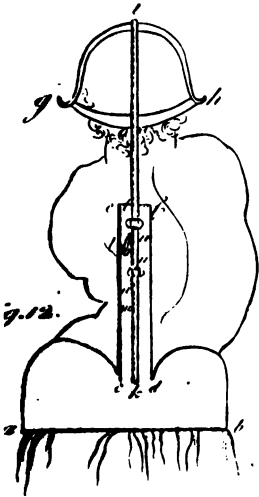




figure 2, and bottom of the leg which
 correspond with the ends of the spring,
 will form resting points for the spring to
 act from, while its re-action, by producing
 pressure on the projecting part of the
 curve of the leg, reduces the bone to-
 wards its natural state. The same effect
 will be produced by either of these me-
 thods, the difference between the modes
 of producing the effect being, that in
 figure 1 the bandages *a. d.* and *c. e.* form
 the resting points, and pressure is made
 upon the curve of the bone by the spring
 at *b.*; but in figure 2, the ends of the
 spring *a.* and *c.* form the resting points,
 and the re-action of the spring produces
 pressure from the bandage *b. d.* upon the
 curve of the bone. I shall now proceed
 to shew, particularly, the manner of
 constructing the instrument for curing
 the deformities of the leg, upon the prin-
 ciples already laid down; by which means,
 those who may hereafter practise this
 method, will be better enabled to de-
 termine, in what manner, they will apply
 these principles, in the cure of such dis-
 tortions

• tortions or deformities as may be entrusted.
 • to their care. The instrument I use to
 • cure curvature in bones of the leg, is
 • constructed as in figures 3, 4, 5, 6, and
 • 7, hereunto annexed, and is described in
 • manner following, that is to say; the
 • foot piece *a. b. c. d. e.* in figure 3 and 4,
 • is made of calf skin, or any other mo-
 • derately stiff leather, in form of a com-
 • mon half-boot, and to lace in front, with
 • the sole of iron, or any other strong
 • metal; and to cure a bone curved like
 • figure 1, I fix on the outside of this sole,
 • a piece of iron, steel, or other convenient
 • metal, *f. g.* in figures 3 and 4, to go in
 • a perpendicular direction, as high as the
 • angle joint at *g.* in figures 3 and 4; with
 • this I connect, by means of a joint, an-
 • other piece of iron, steel, or other con-
 • venient metal, *a. b.* in figure 5, to go as
 • high as the knee; upon this I rivet (but
 • it may be otherwise fixed) transversely, as
 • many pieces of tin, or other metal *c. d.*
 • *e. f. &c.* in figure 5, each about half an
 • inch wide, as will reach from the angle
 • to the knee, and so long, as to be equal
 • to

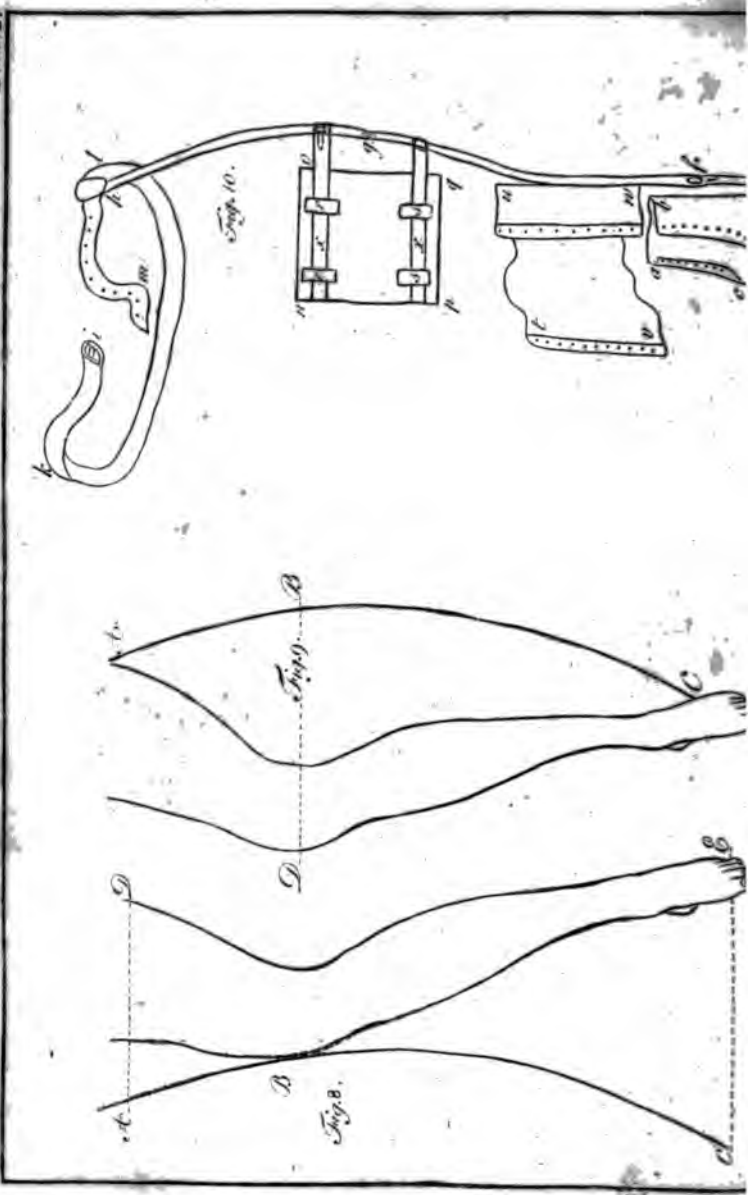
' to about half the circumference of the
 ' leg, the whole way. I continue another
 ' piece of iron, steel, or other convenient
 ' metal, *a. b.* in figure 6, and *b. i.* in figure
 ' 3, to the hip joint; this is connected
 ' with the leg, by a joint at the knee *b.*
 ' in figure 3, and *b.* in figure 5, to allow
 ' the knee to move in its natural directions,
 ' and is fixed by a swivel joint to allow the
 ' hip to move in its natural direction, to
 ' a bandage *c. d. e.* in figure 6, and *k. l. m.*
 ' *n.* in figure 3, that goes round the waist,
 ' and on the outside of that iron, steel, or
 ' other convenient metal, *a. b.* in figure 5,
 ' which bears the transverse pieces of tin,
 ' I fix a spring *a. b. c.* in figure 7, whose
 ' curve is similar to the line marked *a. b. c.*
 ' in figures 1 or 2; this I call the skeleton
 ' of the instrument.—The foot-piece is
 ' lined with any soft materials, to prevent
 ' it from galling the foot; the side of the
 ' leg is guarded in the same manner, and
 ' covered with strong leather, or any other
 ' convenient material, to go all round the
 ' leg; the rest of the bandage may be co-
 ' vered in the usual manner. To apply

D d

' this

‘ this apparatus, the foot must first be laced
 ‘ tight into that part that is intended to
 ‘ receive it, *a. b. c. d. e.* in figure 3.—The
 ‘ part figure 5, which is composed of trans-
 ‘ verse pieces of tin, &c. is then to be
 ‘ moulded, as near to the form of the leg
 ‘ as possible; the leg bandage *o. p. q. r.* in
 ‘ figure 3, is to be laced round the lower
 ‘ part of the leg, as tight as it can be
 ‘ borne, and fixed to remain so, by means
 ‘ of the strap *w. x.* in figure 3; the upper
 ‘ part is then to be laced, as tight as may
 ‘ be, and fixed to remain so, by means of
 ‘ the strap *r. u.* in figure 3, and the strap
 ‘ *s. t.* in figure 3, fastened round the knee,
 ‘ to keep it in its place; and, finally, the
 ‘ bandage *k. l. m. i. n.* in figure 3, to be
 ‘ made fast round the waist. If the prin-
 ‘ ciples I have laid down are attended to,
 ‘ it will be evident, that the skilful ap-
 ‘ plication of this bandage, according to
 ‘ the process I have described, the spring
 ‘ *a. b. c.* in figure 7, which is the efficient
 ‘ part, and which is, as before stated, fixed
 ‘ or fastened to figure 5, will be brought
 ‘ into action upon the curve of the leg,
 ‘ and





' and by regulating the bandages, &c. that
 ' action may be modified and increased,
 ' until the bone is made perfectly straight.
 ' The above is the instrument I make and
 ' use, when the spring is to be placed on
 ' the outside of the leg; when the spring
 ' is to be placed on the inside of the leg,
 ' the instrument I make and use differs
 ' only in this, that it is made to reach as
 ' high only as the inside of the thigh will
 ' allow, and is fastened round the thigh, by
 ' a bandage fixed at the top of the instru-
 ' ment, instead of being fastened round
 ' the waist, by the bandage fixed by the
 ' swivel joint to the top of the instrument.
 ' In the second place, I shall exemplify
 ' the method of curing deformity or dis-
 ' tortion from improper combination of
 ' bones, by explaining the method of
 ' treating that deformity, which is occa-
 ' sioned by the knees bending inwards,
 ' while the bones of the leg and thigh are
 ' individually perfect and straight; which
 ' is one of the most frequent specimens of
 ' this class of diseases. Figures 8 and 9, re-
 ' present a leg of this kind; the lines *a. b. c.*

' in each figure, represent]the curved spring
 ' intended to cure this deformity. In defor-
 ' mities or distortions from curvature of
 ' bones, the bones alone are objects for at-
 ' tention, every thing that covers them be-
 ' ing merely passive ; but in deformities, or
 ' distortions from improper combination of
 ' bones, the muscles, tendons, and liga-
 ' ments connected with them, become e-
 ' qually objects of attention, being some-
 ' times merely deranged, in consequence of
 ' the improper combination of bones, but
 ' at other times some disease or derange-
 ' ment in the muscles, tendons, or liga-
 ' ments, have been the original cause of
 ' the deformity. In the deformity repre-
 ' sented in figures 8 and 9, where the de-
 ' rangement of the connecting ligament of
 ' the joint, the loss of power in the muscles
 ' of the leg, and consequent diminished ca-
 ' pacity for loco-motion in the patient,
 ' are merely consequences of the derange-
 ' ment in the relative position of the
 ' bones, the means proposed to remove
 ' that original disease will likewise obviate
 ' all the consequences ; but in that class
 ' of

of deformities which originate in some defect of the muscles, tendons, or ligaments in the parts affected, our attention must be principally directed to supply or remedy this defect which is the producing cause, or the consequences can never be removed, or even palliated with much effect; that it is proposed to do effectually by my invention. I exemplify the method of constructing instruments for curing diseases of the latter class, occasioned by improper combination of bones, according to the method I have invented, by describing the manner of making instruments to cure that deformity which is occasioned by the knees bending inwards, as drawn in figures 8 and 9. I make the foot piece *a. b. c. d. e.* in figure 10 of this instrument, exactly the same as described in the preceding case in figures 3 and 4; to this I connect, by means of a joint, a spring *f. g. h.* in figure 10, to go from the ankle joint at *f.* to the hip at *h.* if I place the instrument outside the leg, as in figure 9, which I think is the preferable mode; or from the ankle to the

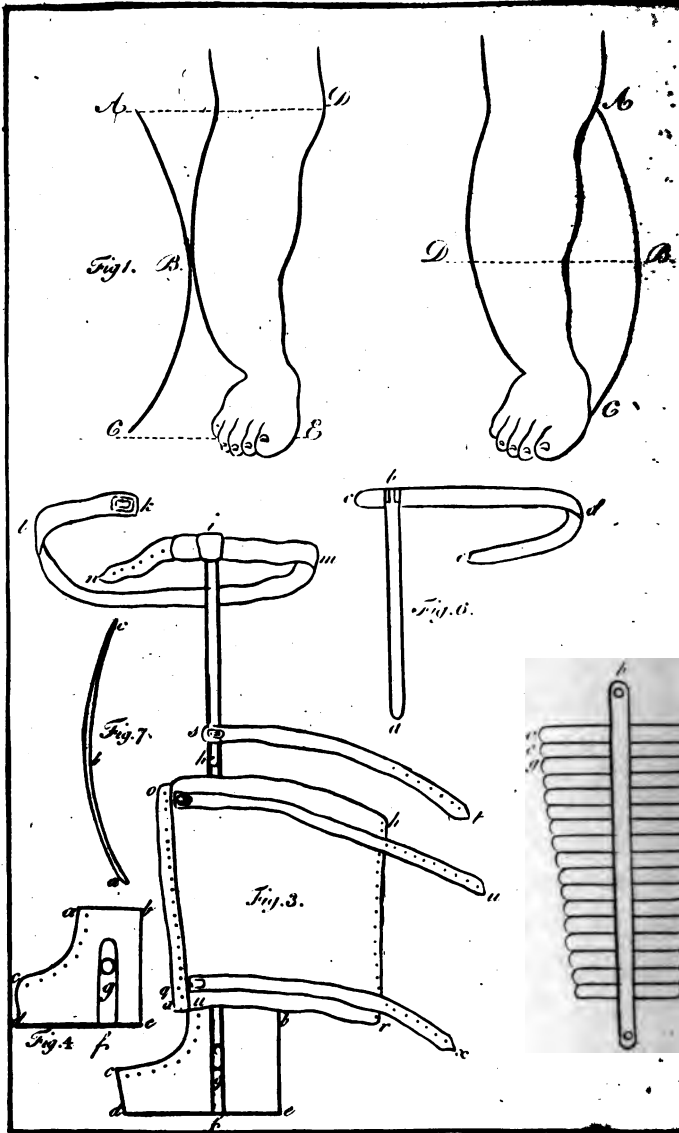
' the top of the thigh, if on the inside, as
 ' in figure 8. The spring *f. g. h.* is made
 ' of two pieces, united by a joint parallel to
 ' the knee, as at *g.* in figure 10, to allow
 ' the knee to move in its natural direction.
 ' If these instruments are for both legs,
 ' they are connected by a bandage round
 ' the waist, as I have already described, as
 ' *i. k. l. m.* in figure 10. Between the
 ' spring and the leg, I place a splint of metal,
 ' or other convenient substance, as in figure
 ' 3, fastened to the inside of the spring, to
 ' cover as much as may be necessary of that
 ' side the leg, to guard it from pressure
 ' from the spring, and to form one of the
 ' resting points; the other is formed by
 ' the bandage *i. k. l. m.* in figure 10, to
 ' which the spring is fixed on the hip. If
 ' the instrument is to be placed on the in-
 ' side the leg, it is made as high only as
 ' the inside of the thigh will allow, and is
 ' fastened round the thigh, by a bandage
 ' fixed to the top of it. These parts con-
 ' stitute the skeleton of the instrument.
 ' To apply it, I fix the foot-piece *a. b. c. d. e.*
 ' in figure 10, on the foot, in the manner
 ' I have

I have described in the preceding case ; I
 then lace a bandage, *n. d. p. q.* in figure
 10, round the knee, upon which are
 fixed four loops, *r. r. s. s.* in figure 10,
u. x. two above, and two below the knee
 joint ; I likewise fix a bandage to the
 splint, *t. u. v. w.* in figure 10, which is
 then laced on the leg. I have, besides,
 two strong straps to the spring *x. y.* in
 figure 10, one above, and the other below
 the knee joint ; I then pass these straps
 through the loops *r. r. s. s.* on the knee
 bandage in figure 10, and fasten them to
 the spring of *f. g.* and *g. h.* above and be-
 low the knee joint at *g*, which, by these
 means, are bound to the limb, and the
 re-action of the spring *f. g.* and *g. h.*
 draws the limb into its proper place.—
 Upon applying this, with what I have
 said on the general principle, as applied
 to figures 8 and 9, the action of this in-
 strument will be easily comprehended.
 In the next place, I shall instance two
 diseases, which may be referred to as
 striking examples of this last species of
 deformities, or distortions from improper
 com-

‘ combination of bones, viz. when a wry
 ‘ neck is produced, either by contraction
 ‘ of the sterno mastoideus muscle on one
 ‘ side, or the loss of power in the same
 ‘ muscle on the other side the head, or in
 ‘ those distortions of the legs, occasioned
 ‘ by contraction of the gastrocnemii mu-
 ‘ scles, and tendo achilles; when that con-
 ‘ traction is the original cause of the dis-
 ‘ ease, or by loss of power in the antagonist
 ‘ muscles; when the contraction of the
 ‘ gastrocnemii muscles and tendo achilles is
 ‘ only one of the consequences of that
 ‘ want of power, however produced. In
 ‘ all these cases, the curative intention is the
 ‘ same, and by my invention, is effected by
 ‘ adopting a spring or springs, to supply
 ‘ the deficiency of action in those muscles.
 ‘ Thirdly,—I shall exemplify the method of
 ‘ curing those defects, which arise from
 ‘ defects of muscular action, whatever may
 ‘ be the cause of that defect, by my me-
 ‘ thod of curing that distortion of the leg
 ‘ and foot, which is occasioned by con-
 ‘ traction of the gastrocnemii muscles and
 ‘ tendo achilles, or by want of power in
 5 ‘ those

' those muscles, whose office is to counter-
 ' act the above-mentioned.—In this kind
 ' of disease, the heel is drawn up, and the
 ' toe pointed straight forwards, with more
 ' or less rigidity, according to circum-
 ' stances ; the curative intentions are, to
 ' place the limb in its natural position, and
 ' restore (if possible) the natural action of
 ' the muscles. I examine the diseased part,
 ' to discover what muscle is deficient in
 ' contractile power, and consider in what
 ' direction that muscle would draw the
 ' parts, if in its natural state : I then pro-
 ' vide, and apply a spring, whose power is
 ' equal to the natural power of the defec-
 ' tive muscle, and whose curve is such, that
 ' when bound on the limb, its re-action
 ' will draw it, as much as possible, towards
 ' its natural state. If the disease is occa-
 ' sioned by defects in the action of more
 ' than one muscle, I provide a separate
 ' spring, to imitate and supply the action
 ' of each of the defective muscles, and
 ' apply them separately, and alternately,
 ' varying their powers and action, until
 ' the whole disease is eradicated : I apply

' these springs in the following manner ; I
 ' provide a splint of tin, or other conve-
 ' nient substance, to cover one half the
 ' leg, and serve as a basis for the springs
 ' to act from ; this splint is lined with lea-
 ' ther, wool, or other convenient sub-
 ' stance, to prevent it from galling the
 ' part ; it is then bound on the leg, with
 ' any kind of bandage that may be conveni-
 ' ent ; I then bind the spring in such a
 ' direction, that its re-action will draw
 ' the limb, as much as possible, towards its
 ' natural state, and leave it in this con-
 ' dition for one, two, or three days, ac-
 ' cording as the circumstances of the case
 ' will permit ; I then unbind it, and alter
 ' its direction, &c. so that it may produce
 ' a farther effect ; or if it is a complex case,
 ' and various springs are necessary, I ap-
 ' ply a different one, for the same or a like
 ' space of time, and thus proceed gradu-
 ' ally, until the cure is complete. There
 ' is another species of deformity, arising
 ' from, or connected with improper com-
 ' bination of bones, that may be materially
 ' benefited by this invention, *viz.*—Incur-
 ' vation



Sheldrakes Patent.

' vation of the spine and its manifold con-
 ' sequences : upon this subject I shall lay
 ' down a simple proposition, which those
 ' who are acquainted with the structure of
 ' those parts will comprehend, and then
 ' more particularly explain the application
 ' of it. All the mechanical methods of
 ' treating this disease, that have as yet
 ' been practised, are reducible to two, *viz.*
 ' First, To produce extension of the spine,
 ' by suspending the weight of the body from
 ' the head; and, secondly,—By firmly em-
 ' bracing the head and pelvis, and, by me-
 ' chanical means, lengthening the space be-
 ' tween them. It may be said, with truth,
 ' that either of those means will have
 ' effect; but my invention added to these,
 ' makes a material improvement upon them:
 ' my principle, as applied to this disease, I
 ' thus demonstrate: Let the curved line
 ' *a. b. c.* in figure 11, represent the distort-
 ' ed spine, the lines *d. e.* and *f. g.* at the
 ' top and bottom thereof, the parts of any
 ' apparatus fixed on the head and pelvis;
 ' it is obvious that if such apparatus is
 ' firmly fixed on those parts, and after-
 ' wards sufficiently lengthened, the curved
 ' spine,

' spine, that is extended between them,
 ' must in the end become straight; but my
 ' improvement is to add springs, properly
 ' adapted, to press, at the same time, on
 ' the projecting part of the curve, by
 ' which means the extension is acceler-
 ' ated and facilitated, so that the curve
 ' will be straightened in much less time,
 ' and with less force, and less inconve-
 ' nience to the patient, than by any other
 ' method. I shall now proceed to the
 ' application of my invention to cure dis-
 ' tortions of the spine, which are the
 ' most complex and most varied of diseases
 ' arising from improper combinations of
 ' bones, and which I thus demonstrate.
 ' Figure 12 represents the instrument for
 ' curing that disease, invented and made
 ' public by me, sixteen years ago, and
 ' which is no part of my present invention,
 ' or included in this patent—*a. b. c. d. e. f.*
 ' is the part intended to fix on the pelvis,
 ' *g. h. i.* is the part to fix on the head, and
 ' *j. k.* the back; which connects the two;
 ' on this is the spring catch *l.*, which falls
 ' into notches, *n. n.* in the upright bar *c. d.*
 ' *e. f.* as it is raised, and thus produces
 ' extension.

‘ extension. The figure 13, represents the
 ‘ back view of a patient with distorted spine,
 ‘ and, in consequence, projection of the
 ‘ ribs, and enlargement of the scapula on
 ‘ one side, with a proportionate diminution
 ‘ of those parts on the other side ; and, fi-
 ‘ gure 14, represents the spinal machine
 ‘ (which forming no part of my present
 ‘ invention, it is unnecessary for me to
 ‘ describe) with additions upon the prin-
 ‘ ciples of this invention, consisting of a
 ‘ pad, *a. b. c. d.* properly guarded, and con-
 ‘ nected with springs *e. e.* and *f. f.*, fixed
 ‘ to the back of the machine at *e.* and *f.*,
 ‘ and intended to press on the projecting
 ‘ ribs ; another pad, *b. i. k.* connected by
 ‘ springs, with the inside of the back of
 ‘ the machine, and intended to press on
 ‘ the projecting scapula ; one elastic spring
 ‘ strap, connected with it, is intended to
 ‘ depress the elevated shoulder, *b. g. k.* and
 ‘ a similar one, *l. m. n.* to raise that which
 ‘ is below its proper situation. Whoever
 ‘ considers the general principles of this
 ‘ my invention, in this, its application to
 ‘ the class of diseases at present under
 ‘ con-

‘ The incurvation of the bones of the leg is considered,
‘ with an explanatory plate.

‘ In considering this work, it is necessary to remember,
‘ that *figulus figulum odit*; one truss-maker another: but,
‘ on examination, it must be confessed, that Mr. SHELDRAKE’s
‘ observations are *reasonable*, and that the intentions of the
‘ elastic bandages are *plausible*. The incurvation of the bones
‘ of the leg certainly require mechanical contrivances to
‘ remove their deformities; and if, on experience, the inven-
‘ tions of Mr. SHELDRAKE be found superior to those hither-
‘ to used, he will merit the approbation of all mankind.’

As we are all, in different degrees, the children of im-
perfection and error, it is not unreasonable to conclude, that
this Reviewer misunderstood a part of my design, because I
did not sufficiently explain it. I certainly had no intention
to *animadvert on the defects of others*; my design was to shew,
exactly, what had been done by others, that I might make
good my title to what afterwards might be done by myself:
having done so, I have, in the present work, confined myself
to the explanation of my own system and its effects, which
I hope, will prove what claim or pretence I may have to the
premium held out by the Reviewer, *viz.*

‘ *The approbation of all mankind.*’

AN
APPENDIX
TO A
PRACTICAL ESSAY
ON
DISTORTION
OF THE
LEGS AND FEET OF CHILDREN, &c.

CONTAINING
**SIXTY-TWO CASES THAT HAVE BEEN SUCCESSFULLY
TREATED IN PATIENTS BETWEEN THE AGES OF
TWO WEEKS AND TWENTY-FIVE YEARS,
&c. &c.**

By T. SHELDRAKE,

TRUSS-MAKER TO THE WESTMINSTER HOSPITAL.

LONDON:
Printed for the Author, and sold at his House, No. 50, Strand.

1806.

Printed by Cox, Son, and Baylis,
75, Great Queen Street.

APPENDIX

TO AN

ESSAY ON DISTORTION OF THE FEET, &c.

WHEN the Essay on Distortion, &c. was first published in 1798, the opinions that had been, previously, entertained upon the subject, rendered every precaution necessary to authenticate the facts that were contained in it; and, as the uniform success of my practice since that time has enabled me to ascertain that cases of deformity which, at the period of the former publication, I should have thought it would be impossible to cure, may certainly be restored to the natural state, it becomes equally necessary, in publishing these Cases, to connect with them such general observations on the subject as will lead to a more accurate knowledge of the diseases in question, and enable us to ascertain with some precision, under what circumstances similar deformities are curable or otherwise.

Very few writers have attended to this subject at all; and, of the few who have done so, the greater number have only considered a distorted leg as a mass of matter turned or twisted out of its ordinary shape; and, as a consequence of this simple mode of investigation, they have inferred that nothing more was necessary to effect a cure, but to twist or turn it back again; the practice that has been founded upon this theory is certainly worthy of it, as to depth of knowledge and ultimate success. Such having been the state of knowledge upon this subject, it is not surprising that the real nature of the various diseases that have been described by one or two general terms should be so little understood, or that almost nothing should be done towards establishing a rational method of cure, or even ascertaining with precision what distortions are capable of being cured. The following pages will not only

only contain a series of cases, remarkable and important of themselves, but an attempt to investigate the circumstances in which the parts of the diseased limbs differ from those in their natural state, the causes which produce the defects, and the alterations which must take place in order to effect a cure.

In doing this, an arrangement will be adopted as similar to that which has commonly been used, as the proper treatment of the subject will allow. Preceding writers have divided distortions of the legs into two classes, which they have called varus and valgus : under the first title they have included all those distortions in which the feet are turned inwards ; under the other, are included all those distortions in which the feet are turned outwards. Under these two heads have been included all distortions of the legs, by whatever cause they were produced. This general division will be adopted on the present occasion ; but, as there are distortions which cannot be referred to either of those divisions, it will be necessary to form these into a third class by themselves.

In combining observations with facts, we may either give to observations the form of theory, and produce the facts to support that theory, or simply state the facts, and deduce such observations from them as they may seem to warrant : the latter arrangement appears to be the least exceptionable, and will, therefore, be adopted on the present occasion.

CASES OF VARUS, OR CLUB FOOT, IN WHICH THE FEET ARE TURNED INWARDS.

CASE I.

Miss W., aged one week, was placed under my care October 25, 1798. Her left foot was slightly distorted, to all appearance very flexible, and, when moved by the hand could be placed nearly in its natural position ; in its general appearance it resembles that which is represented in pl. 8, p. 28, of the Essay on the Club-Foot. The strictest, the most regular attention was paid to this case in every respect, yet seven months elapsed before the foot was restored to its perfect state.

CASE

CASE II.

Master B. was born with two feet distorted, their form and position resembled the former case, and seemed to be very like it in every respect. He was placed under my care May 9, 1789. In three weeks his feet appeared to be perfectly reduced to their natural form, and shewed no tendency to return to their deformed state. I kept him a fortnight longer under my observation, and then relinquished the care of him entirely; I saw him two years afterwards, and his feet remained perfect.

CASE III.

Master B. had one foot distorted, so as nearly to resemble that of Case VI, p. 22, of the Practical Essay on the Club-Foot. By the advice of a medical gentleman who had seen that case before and after it was under my care, Master B. was entrusted to my management at the age of six months. In something more than four months the foot was reduced to its natural form, but remained weak; the parents had brought him from a considerable distance in the country; they were not in easy circumstances, and though they had contrived to stay so long as had enabled me to reduce the foot to its form, they would not remain till the cure was permanently established; they determined to return home with such instruments as I could supply them with to keep the foot in its proper position, and I saw the child no more. It was found necessary to use such instruments for more than twelve months, and I was afterwards informed that the child continued quite well.

This is one of the very few cases that have been removed from under my care before the cure was established, and, notwithstanding, have done well.

CASE IV.

Miss B. was born with her right foot distorted, the toes turning inwards, and the whole of the foot so curved, that if she had been able to stand her ankle would have rested on the ground. A difference of opinion had existed between two gentlemen who had been consulted on the case, and, in consequence, she was three months old before she was put under my care. August 4, 1798.

At this time the foot remained nearly in the same state, as to appearance, as it was at the time of the birth; its general form so nearly resembled Case VII. which is

drawn and described in p. 26 of my Essay on the Club-Foot, that I thought it unnecessary to make any other model or representation of it.

The method of cure that has been described in that Essay was adopted and steadily pursued till November 6, in the same year, when the foot appeared to be restored to its natural form and functions, no further attention was thought necessary, and it has remained perfect till the present time.

CASE V.

A son of D. was born with his left foot distorted, so as to resemble the former case in every particular. He came under my care August 20, 1798, and, judging from my former experience, I supposed that in a very few months his foot would be completely cured: the parents were so situated that it was necessary for them to bring the child to my house, and, as but too frequently happens with such people, they were not regular in their attendance; yet, notwithstanding several instances of neglect, by the end of November, in the same year, the foot was so far restored to its form, &c. that they thought proper to discontinue bringing him entirely.

About the latter end of the ensuing January however, they returned with a plausible tale, that illness had prevented them from bringing the child quite so long as I had directed them to do, and now they *feared his foot was not quite so well as it was*, and therefore begged I would look at it again and see if any thing more could be done for him: in fact, his foot was as much deformed as it ever had been; the child was several months older, shewed a disposition to use his feet, and his efforts to do so were increasing the distortion.

The irregular conduct of these people would have justified me in refusing to take this child under my care again; but the case was, as a relapsed one, under new circumstances, and as I wished to try the effect of interrupted irregular treatment, in opposition to that steady perseverance which I thought would be indispensably necessary to ensure a radical cure of this disease, and I believed the disposition of these people would afford me the opportunity I wanted to make the experiments without its being in the least my own act, I therefore took the child under my care again, after their solemnly promising to attend me regularly till I should declare the child was perfectly

perfectly cured; this promise was kept as the former; i. e. in about five months *they* thought the foot was entirely well, and they again disappeared.

Still they were mistaken; the foot relapsed, and, after the expiration of four months, they appeared again with the foot as much distorted as at first, aggravated by the boy walking on it, and thus materially increasing the deformity. I was now completely disgusted with the conduct of these people, but having never spared trouble or expense to ascertain any fact that it might be desirable to know, I determined to resume the care of this child, and follow it as effectually as the folly of the parents would allow; and, indeed, they acted as they would have done had they divined my purpose, and resolved to indulge me in trying the experiment to the utmost. During four years was I employed, at intervals, upon this case, and whenever the foot *appeared* to be well, they neglected to attend, till it relapsed sometimes in a greater, sometimes in a less degree: my perseverance, however, prevailed in the end, and when I saw the boy was well, I discharged him, and have seen him several times since walking in the streets with his foot perfect in its form and all its actions.

CASE VI.

A daughter of Mr. D. aged two months, was brought to me May 17, 1799. Her foot was distorted by the toes turning inwards. The general appearance of the foot resembled that of Case VII, p. 22, of Essay on the Club-Foot; it was not perfectly rigid, but could not be placed in its natural form; the general appearance of this case indicated, that, with regular attention, it might be completely cured in a few months. These people were required to bring the child to me, and, like the preceding, it proved extremely troublesome to me, and a farther proof of the disappointment that must be occasioned by want of regular attention: they attended regularly till the end of August, when the foot appeared to be restored to its natural form, but incapable of acting, and in a state of debility that would have required long attendance to render the cure complete; but as soon as the foot had resumed its natural form they thought all farther care would be useless, and therefore disappeared.

In the beginning of December, however, the child was brought back to me with its foot as much distorted as at first. I again took charge of it, and by the end of April

April had reduced it to its natural position ; it had a considerable degree of voluntary motion, but not the requisite degree of strength ; and peculiar circumstances were evident that would require unremitting attention, to secure the patient from a relapse : she was, however, withdrawn a second time before she was well.

In the month of September following she was brought back again, with her foot more distorted than when she was last removed, but not by any means so much as at first : I had now ascertained that the parents of this child were not to be relied on for regularity of attendance ; I foresaw trouble and vexation in prosecuting this case, yet the same motives which regulated my conduct in the preceding case made me resolve to persevere, if possible, in the cure of this ; but in this attempt I was disappointed. During two years she was brought to me occasionally, and kept away as soon as the parents thought it was not necessary to attend longer ; and their perseverance in this system was so obstinate, that I could not foresee how much time might be wasted in counteracting the effects of their misconduct, and, finally, abandoned the case. I have lately seen this child ; she walks flat on her foot, with the toes turned inward, her foot is ill formed, and she does not appear to use the ankle joint.

The particular circumstances which would have rendered the cure of this case more tedious than any of the preceding, even if it had been regularly attended, were occasioned by the position of the fibula which was thrown so far backwards, that the end of it, which forms the outer angle, lay close to the tendo achilles ; in consequence of which position its support was wanting to keep the astragalus in its place, and give stability to the ankle joint. In other cases I have been able to remedy this effectually, but it is always tedious and requires the most persevering attention.

CASE VII.

Mrs. G. had a son born with two distorted feet ; the incurvation was considerably inwards ; several ineffectual attempts had been made to reduce them to their natural form, but without the least success ; and when the child was nine months old, Dr. B. advised her to apply to me. The child had always been healthy, was strong, active, and desirous of using its feet, which were at this period rigidly fixed in their distorted state, so that he would, if permitted to walk, have walked upon his outer angles, the toes

toes turning directly inwards. This child came under my care August 7, 1798, and October 16, 1799, was discharged perfectly cured. I saw him four years after he was cured, and there was no one circumstance remaining to indicate that his feet had ever been distorted.

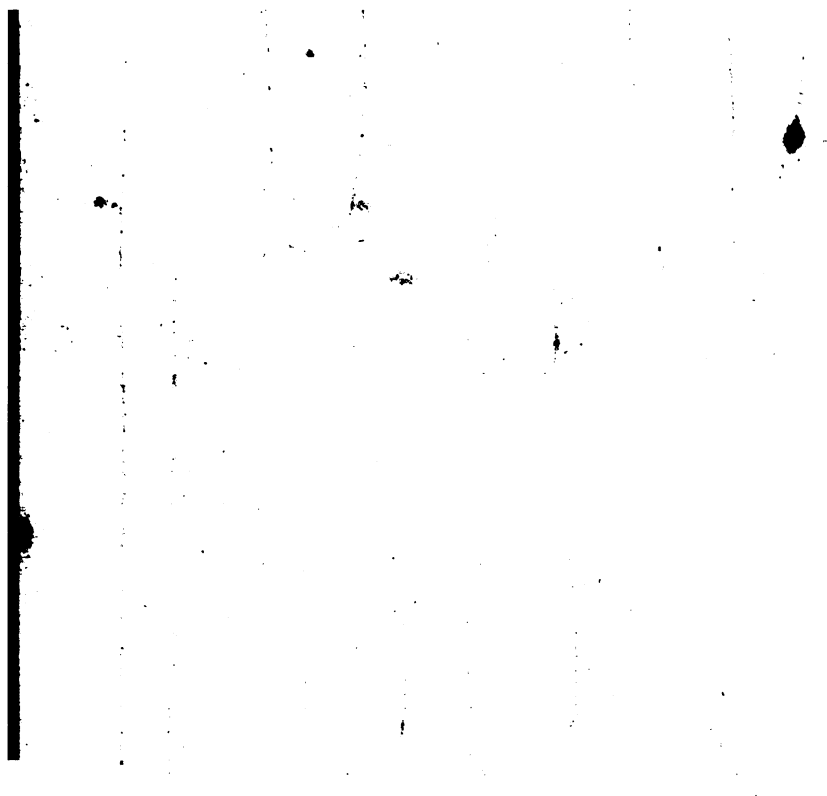
CASE VIII.

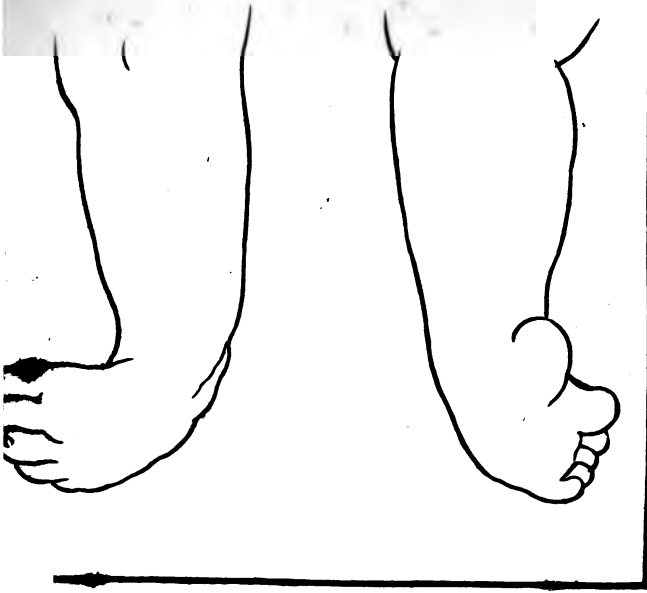
The same Mrs. G. had a second child born with its feet distorted, in the same manner as the preceding, and resembling it in every respect. This child was two months old when placed under my care, May 1, 1800: it was regularly attended till January 27, 1801, when its feet seemed to be perfectly restored, and the cure was considered as complete, and all attention to the case discontinued. In January 1804, I was again consulted about this child; his mother said, he had continued well, to all appearance, for more than a year after he had been removed from under my care; he then began to turn in his toes as he walked, which defect continued to increase till the time I saw him: he still walked flat on his feet; but his ankle joints were rigid, and there was much peculiarity in his gait, in consequence of this defect, which, there was every reason to suppose, would continue to increase. To prevent this he was again placed under my care, and, in about four months, his feet were perfectly reduced to their natural form and action, and he was, finally, removed from under my care. I have seen him since, and there has not appeared the least tendency to relapse.

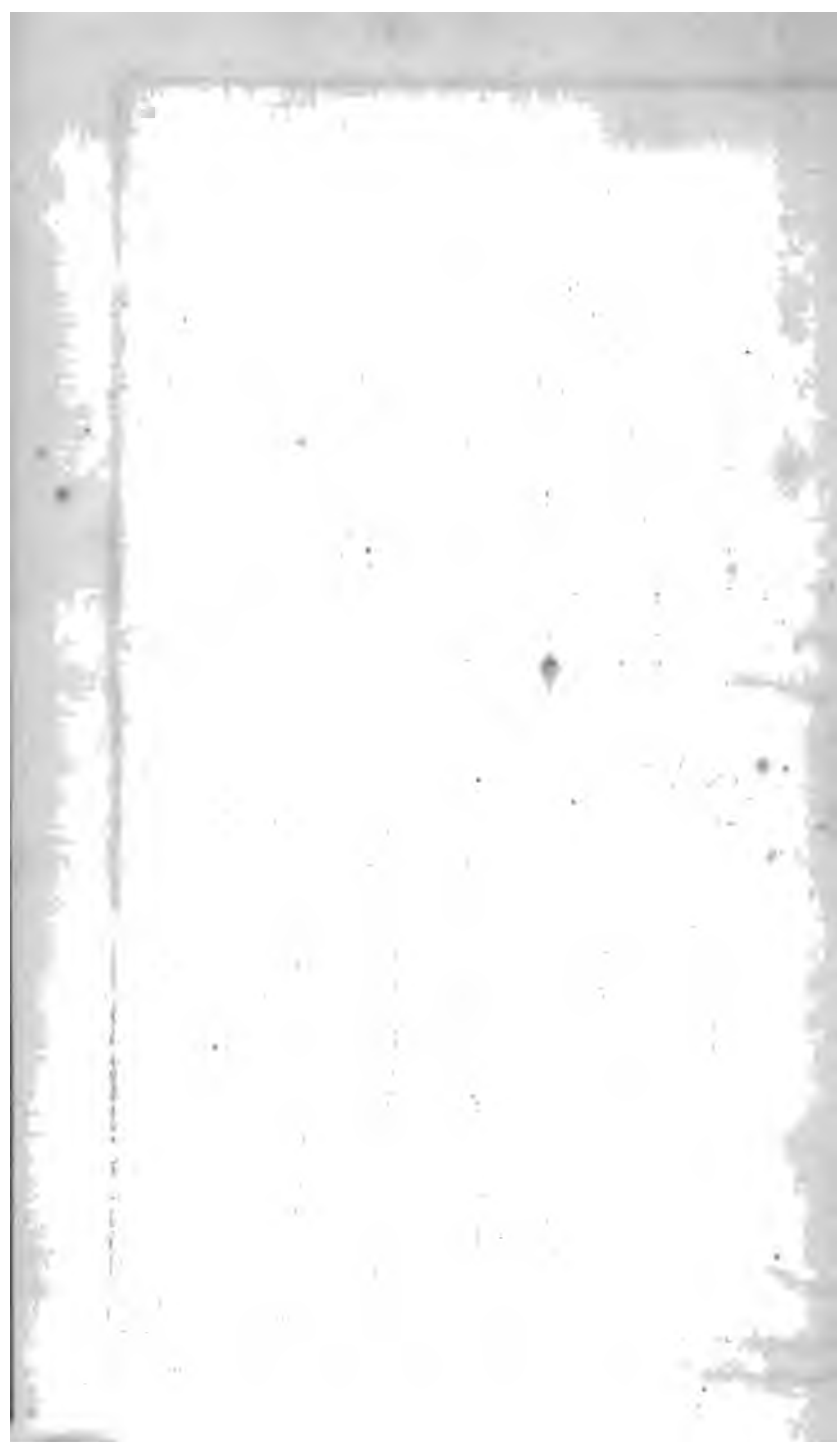
CASE IX.

J. P. had a child born with two distorted feet, very like the former, July 30, 1800. He was placed under my care, being then ten weeks old; November 10, in the same year, the feet were perfectly reduced to their natural form, but were incapable of any voluntary action. The parents of this child were very poor people; they lived at a considerable distance, and the time that was necessary to attend with the child interfered so much with the employment by which they got their living, that they were glad to embrace the first opportunity to put an end to their attendance, which they did at this time, though strongly cautioned as to the probable consequences.

Fourteen months afterwards they returned with the child, his feet worse distorted than they had been at first, and most rigidly fixed in their present situation; they said that,







pable of acting in obedience to the will of the child, and I was authorised in saying they would require long attention to complete the cure. Mrs. M., however, was at a distance from home, to which she wished to return; she was pleased with the appearance of the child's feet, and flattered herself that she would do what was necessary to secure the advantage that had been gained, till the child acquired strength to support himself. She consulted the late Mr. Rush, whose opinion she interpreted as being favourable to her own, and therefore returned into the country with her child.

In the month of April ensuing, she wrote to inform me that the child's feet were much worse, and as she could not come to London again, she determined to send the child to be placed near town, under the inspection of a friend; the nurse was to bring the child to my house.

I found the feet were much relapsed, with the additional disadvantage of the patient being several months older, and so much disposed to walk upon his feet, that it was difficult to keep him from doing so, till they were reduced to such a state as would enable him to walk with propriety. These difficulties were at length overcome, and by December following, the feet were again reduced to their natural form, the child was able to walk upon them in the natural manner, and nothing seemed wanting to complete the cure but to preserve the feet in their proper position, till they had acquired strength to support themselves.

As Mrs. M. had once attempted to do this, and failed of success, I endeavoured to prevail on her to suffer the child to remain within the sphere of my observation, till he was quite well; but in vain; he was again removed from my care, and I heard no more of him till July 27, 1804, when I was again applied to for assistance.

At this time he stood flat upon his feet, but his toes were turned considerably inwards; his feet were imperfectly formed, though the distortion was quite different from what it originally was; the articulation at the ankle joint was rigid, and when he walked, from the cause last-mentioned, he made a circumflex motion with each foot, instead of moving it directly forwards, by which means the knees were inclined to bend inwards.

As these two relapses have, undoubtedly, been the consequence of removing him from under my care before he was well, Mrs. M. is now determined that he shall remain till he is quite well, and placed beyond any risk

of relapse; and I have the satisfaction to know, from the alteration that has been produced since his return, that a perfect cure will certainly be effected in the end; as the cure is, at the time of writing this, incomplete, it would be useless to add any representation of the present form of his feet, which shall be done at a future time, when the history of the case shall be resumed.

CASE XII.

Master F. was born with both his feet distorted, June 29, 1799. He was placed under my care, being then eight months old; both his feet were alike, and so perfectly resembled the model that is represented in plate 1 of this work, that it was not thought necessary to take any other model of this patient's feet.

His parents lived at some distance from London, and undertook to bring him to my house every time he was to be dressed: the difficulty and trouble of such an undertaking gave rise to irregularity in attendance, and occasioned additional uneasiness to the patient, besides procrastinating the cure to a very unusual period: it was the latter end of the year 1801 before I felt myself justified in relinquishing the case as perfectly cured. At this time his feet were completely reduced to their natural form, and he was able to use them, in every respect, as well as any other child of his age.

They remained in this state for nine months, after which his right foot became weaker, and went on progressively losing its power of action, and becoming deformed again. He was once more placed under my care, and at the present time his right foot has again resumed its natural form, and acquired much power, but is not yet so well as to be left to itself. The left foot has never shewn the least tendency to relapse since it was cured in 1801, and its form is as perfect, and its powers as great as can be wished in every respect.

A reference to pl. 1. will shew, what was the state of this case at the time the patient was placed under my care. In the annexed pl. 2. I have drawn two views of both the feet: these were drawn from models which were made in July 1805, and perfectly represent the state of both the feet at that time. I add the following measurements of each foot, as they were accurately taken upon those models.

Right

	Right Foot. Inches.	Left Foot. Inches.
Length of the foot - -	7	8
Circumference at the toes -	7 $\frac{1}{2}$	7 $\frac{1}{2}$
Ditto round the heel and instep	10 $\frac{1}{2}$	10 $\frac{1}{2}$
Smallest part of the leg -	7	6 $\frac{3}{4}$
Largest - ditto - -	8 $\frac{1}{2}$	9 $\frac{1}{4}$

The two legs are of equal length.

From this cure many inferences may be drawn to illustrate the nature of the disease, and the alterations that take place during the progress of the cure. Here, it will only be necessary to notice one circumstance, viz. the difference of size in the two legs, in consequence of the one being perfectly cured, and the other having unexpectedly relapsed.

When the patient came first under my care the deformity of both feet was nearly equal, but the right foot was the most rigidly fixed in its deformed state, and therefore it was natural to presume that it would require more time to effect a perfect cure; and this seems actually to have happened: for though they were both, to appearance, quite well when he was removed from my care, and continued so for several months afterwards, yet there can be no doubt that a latent weakness in the ligaments of the right foot rendered *that* less able to support the natural action, and occasioned it to relapse into a state of deformity, towards which the left foot never shewed the least tendency to return.

This debility, and the want of power, in the deformed foot, to act equally with the other foot, evidently accounts for the difference in the size of the two legs; this difference will, in all probability, disappear when the natural action of the right leg is regained to its full extent. The shortness of the right foot is to be attributed to two causes: viz. 1st. a derangement in the natural connection of the bones of the foot; and, 2dly. deficiency of growth in those bones, in consequence of the want of natural action. There is every reason to suppose, that so much of the difference of the length of the two feet as is the consequence of improper combination in the bones of the deformed foot, will be removed when that is restored to its natural state; but so much of the difference as is the consequence of want of growth in the deformed foot to the present time, will never be supplied: *i. e.* suppose when the right foot is perfectly cured it should remain half an inch shorter than the left foot, because it

has not grown so much, up to the present time ; from the time present it will grow equally fast till the patient becomes adult, as his left foot will grow in the same time ; therefore when he is arrived at maturity, his right foot will be but half an inch shorter than his left, a difference that in the feet of a man will not, with a little aid from the shoemaker, be perceived : but if both the feet had been perfectly cured at the same time, there would have been no difference whatever between them.

CASE XIII.

A son of Mrs. B. was placed under my care at the age of five months ; both his feet were distorted, so as nearly to resemble the preceding case ; they were equally rigid ; the child was remarkably strong, healthy, and active ; so much so, that it was with difficulty he was prevented from attempting to use his feet. He came under my care September 23, 1799, and was not perfectly cured till January 20, 1801, when he was discharged perfectly well in every respect, and has remained so ever since.

CASE XIV.

A son of Mrs. W. was placed under my care July 18, 1799. The child was healthy, his feet were distorted, so as nearly to resemble those in the preceding case, and which it likewise resembled in every other particular ; it was regularly attended till February 20, 1800, when it appeared to be perfectly cured, and I thought all farther attention unnecessary : I saw it a considerable time afterwards, and it continued quite well.

CASE XV.

April 15, 1799, Mrs. W. consulted me about her son, who had both feet distorted from the birth. She had applied to several persons for relief, but without success. At the time I saw him he was fifteen months old ; healthy, active, and disposed to make use of his feet, but had, with much difficulty, been prevented from doing so. In their general appearance, his feet resembled those of the preceding cases, but were more flexible, so that they might be turned nearly into their natural position without any violence, but immediately returned to their former position on removing the hands, as he had no power to guide them ; and, if he had been permitted to stand, he would have rested on the outer angles, with his toes turning inwards.

wards. The necessary treatment was steadily pursued till January 15, 1800, when there seemed to be no further occasion for my attendance, and he was left with simple bandages on his feet, which were to be continued till the parts had acquired strength sufficient to support themselves.

I have since seen this child, and find that his feet never shewed the least tendency to relapse into their former deformed state, and that they are now perfectly well formed, nor have any peculiarity of form or action, which can indicate that they have been distorted in any manner.

CASE XVI.

June 2, 1800, the son of Mr. P. was placed under my care. He was born with both feet distorted, like the preceding case; many attempts had been made to relieve them, but without effect. As Mr. P. resided at a considerable distance from London, it was inconvenient for him to send him to London; but at last, finding there was no other chance of rendering him effectual assistance, he sent him to a near relation, who was a professional man of established reputation, and, by that gentleman, he was placed under my care.

At this time he was twenty-two months old; his feet, in appearance and position resembled those of the last case; but they were less rigid. Every circumstance of the cure went on as favourably as could be expected till December 29 of the same year, when his feet appeared to be perfectly reduced to their natural form; he walked perfectly well upon them, and his parents were convinced that he was quite well. I thought there was some weakness remaining, and wished that he should remain under my care till *that* was entirely removed; his uncle agreed in giving the same advice; but family circumstances induced his mother to take him home, as *she* was convinced the child was quite well, and would require no farther assistance.

Twelve months after the child left London, his uncle was informed that he continued quite well. At a subsequent period, he was told that his ancles were weak, and his toes turned inwards, and he was requested to send some instrument to enable him to direct them properly. This was complied with, and application has again been made for a repetition of the same assistance, which plainly indicates

indicates that he is not now so well as he was when removed from under my care.

The information we have received on this subject is not so explicit as to enable me to give a correct professional opinion upon the present condition of this patient: thus much, however, is certain, that in whatever state he may be short of being perfectly cured, the defect is the consequence of his being removed before he was quite well, and those who were about him being unable to preserve those advantages that had been gained by my attention.

CASE XVII.

March 11, 1801, Master J. was brought to me with two distorted feet, very like the preceding case, but neither so much distorted nor so rigid; but various attempts had been made to remedy the distortion, though without effect. He was, at this time, two years old, and the general appearance of the case induced me to suppose it would be cured in a few months. As he came from a distant part of the country, a relation staid to take care of him, till the amendment was so evident, as to leave no doubt of final success: she then returned home, and left the child to the care of a friend who lived several miles from my house, and in a situation where I could not possibly attend; it was determined that they should bring the child to me. This was regularly done for some time. In December 1801, the feet were completely reduced to their natural form, and nothing seemed to remain but the weakness consequent to the operation, which only required the regular application of bandage to remove. The trouble of bringing, or sending the child to such a distance, made them irregular in their attendance, the bandages were deranged, and not replaced for several days, till a convenient opportunity presented for bringing the child to me. By this means the progress of the cure was retarded, partial relapses took place, and much trouble was incurred to recover the benefit that had thus been lost by want of regular attendance; a species of neglect that it was not in my power to prevent. In consequence of all this misconduct, it was not till July 1804, that I was enabled to discharge this patient as completely cured.

There was no circumstance in the appearance of this case which would have justified me in supposing, at its commencement.

commencement, that it would have occupied so much time; and, indeed, it would not have done so, but for the gross neglect of those who were entrusted with the care of the child; but they did not feel a paternal care for its welfare, and I could not compel them to be regular in attendance, and therefore have gained, with infinite labour, another proof of the importance of *regular attention to remove a disease*, that is frequently, with the greatest exertion, extremely tedious to cure.

CASE XVIII.

Miss A., the daughter of a gentleman in India, was born with both her feet distorted; sent to England in hopes of finding some relief, and by the advice of a professional friend of the family, committed to my care. No attempt had been made while she was in India to alleviate the deformity; she had been put upon her feet at the time children usually walk, and now, deformed as they were, ran about upon them with the greatest activity. It cannot be ascertained what the state of her feet were when she was born; but it is certain that they could not be worse than they were at the time she was confided to my care, October 6, 1800, when she was three years and a half old.

Both feet were alike; as she stood upon them; the toes of each foot turned directly inwards, the astragalus projected forwards before the tibia, and the os calcis was close to it on the back part, and thus produced that appearance, which those who are unacquainted with the nature of the disease, or the real structure and combination of the parts concerned in it, frequently describe by saying, the child has a very small heel, and some bones of the foot are wanting. In this form the feet were rigidly fixed, without the least apparent motion, and there was a large callosity formed on the outside of the foot, which, in the condition she was, she had always walked upon. From the feet, in this state, I had two accurate models taken, and they are still in my possession.

The operation of reducing the feet to their natural form was immediately begun, but from the extremely rigid state they were in, it required fourteen months constant attention before it was completely effected. Though the child suffered very little uneasiness from the process, and at the time this was effected, her feet had the general form and position of other feet; she could walk upon them perfectly

perfectly well when supported by proper instruments, but they were useless to her when not thus supported: when the support was removed, they immediately relapsed into their former position. She had not the power of regulating the action of any one muscle, so as to direct the motion of her feet, and there is no doubt that if she had been left at this time, either without assistance, or to the management of those who were unacquainted with the subject, she would soon have relapsed into her original deformed situation.

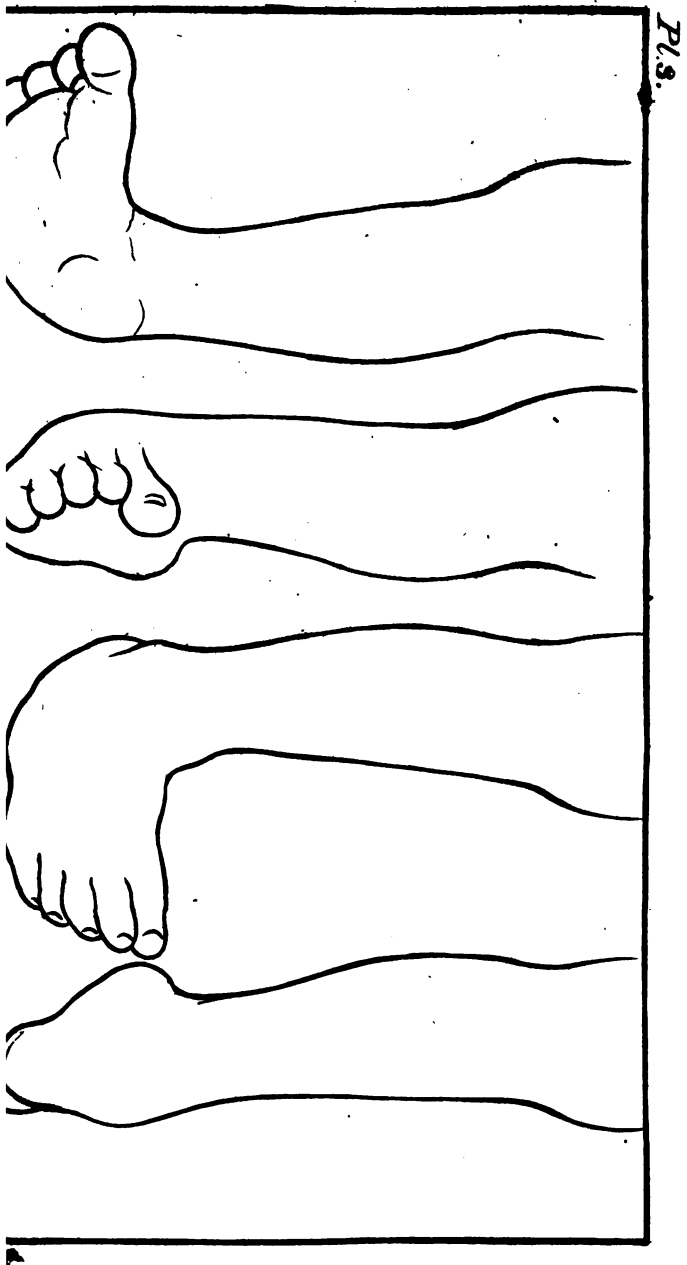
To prevent this, the requisite attention was paid till the end of the year 1803, to perfect the cure; at which time she was able to walk as much and as well as any other child of her age; her feet were perfectly well-formed, and there did not exist any one circumstance which could indicate that they had ever been distorted. She is now removed to a distance, which renders it impossible for me to see her, but I have lately inquired of her friends, and am told that she continues perfectly well.

When the cure was completed I had two models taken from her feet, as they then were: as the feet were, at this period, as well as at first, alike, it is needless to delineate them both. But I have inserted in pl. 3. four views taken from that model, which represents one of the feet in its originally deformed state; and in pl. 4. four views of the model, which were taken from the same foot after the cure was complete. By comparing these sketches with the models now in my possession, it will be seen, that the representation here given is correct. I subjoin the measurement of the two models.

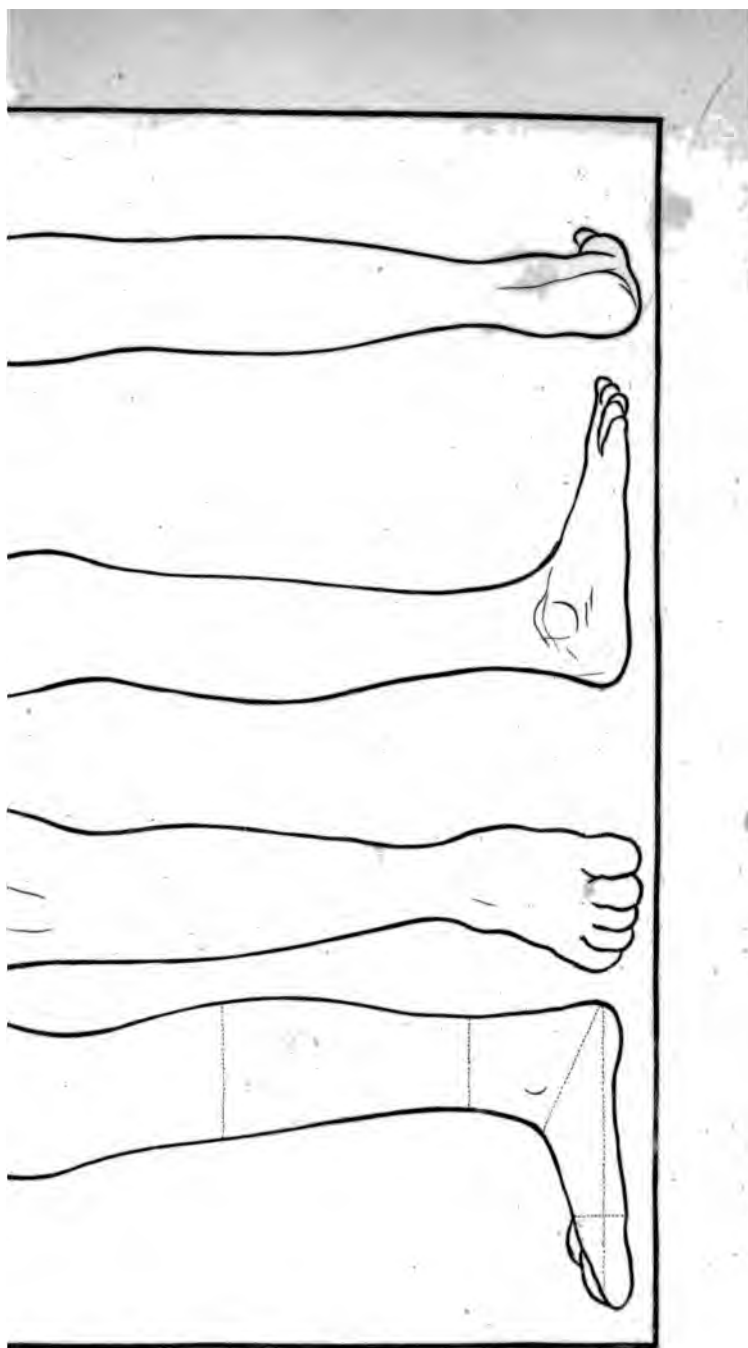
	In the Diseased Foot. Inches.	In the Restored Foot. Inches.
Length of the foot - - -	5 $\frac{1}{4}$	7 $\frac{1}{4}$
Circumference of the foot at the toes - - - - -	6	6 $\frac{1}{2}$
Ditto at the heel and round the instep - - - - -	8	9
Length of the leg, when standing, from the patella to the heel	9	12 $\frac{1}{2}$
Circumference of the leg at the smallest part - - -	5 $\frac{3}{4}$	5 $\frac{3}{4}$
Ditto at the largest - - -	8	8 $\frac{1}{2}$

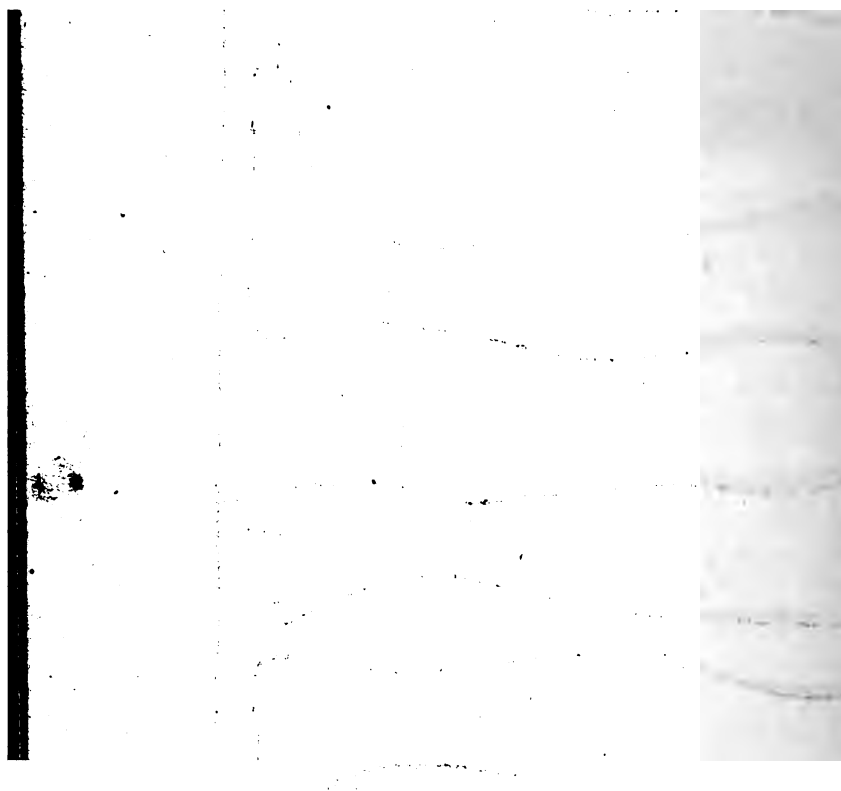
I have marked on one of the sketches the parts on which the measures were taken.

It must be remarked, that all the variation in point
of









of *form* between the two models that are represented in these two plates, is to be attributed to those operations by which the feet were cured; and the variation in point of *size* between the two states of the feet, is partly to be attributed to the same cause, and partly to the growth of the child during the three years the cure was going on. But these alterations are so extraordinary, and throw so much light on the nature of the disease, that I trust I shall be excused for taking this opportunity to examine them more particularly.

If the two models were shown to any one who is totally uninformed on the subject, it would be difficult for him to believe that they both represented the same individual limb; the general shape of the whole, and the relative proportion of the parts, so far as they can be seen upon the surface, differ so much from each other in those two models, that it would not be surprising for such a person to say, it is impossible that they should be the same; even such professional men as have not accurately investigated the subject, might make the same mistake. The shortness, as it has been called, of the heel in particular, is a circumstance that has frequently given rise to an opinion that the bones of the foot, in these cases, are deficient in number, size, or form; but in no case that I have seen has this been so; yet, I have often been told, with a sneer, by professional men who have been consulted upon such cases, that unless I could introduce bones that were wanting into the foot, or increase the size of those that were too small, it would be in vain to attempt the cure of the disease. The present case would excuse such reflections as much as any that can be produced; it exhibits all the peculiarities that are supposed to indicate such deficiency in the number, structure, or size of the parts which are concerned in the disease; it has been cured; an accurate representation of the original disease and of the restored foot now lies before us; let us then see what it is that constitutes the difference between them.

The foot, considered as a whole, is two inches longer in the restored than it was in the original state; *i. e.* if we measure the two models from the hinder part of the os calcis to the longest part of the toes, as a shoemaker does when he measures a shoe: what is the cause of this difference?

In the model of the restored foot, as in a foot that is naturally formed, if a line was drawn straight along the inside from the end of the great toe to the heel, it would touch the side of the foot the whole way; but if a similar
D straight

straight line was drawn from the great toe to the heel of the deformed foot, the inside of the foot, instead of laying close to the line, would form the arch of a bow, the heel and toe only touching the line which represents the chord. The operations by which the foot is reduced to its form, alters this vicious arrangement of those parts, and thus gains the greatest part of that length which, if it was not thus explained, would seem to be incredible. The circumference of the foot, round the toes, is the same in each state of the case, because, in the original disease, at least in every case that I have seen, the toes are spread wider from each other than in those parts of a foot that are naturally formed; in effecting a cure, this vicious structure of the parts is corrected, and the breadth and circumference of the toes remain nearly the same.

The circumference of the foot, taken round the os calcis, and what is commonly called the instep, is increased one inch. This may be fairly attributed to the actual growth of the parts, notwithstanding the form of the foot is entirely altered in those parts, so much that the instep, in the restored foot, is not formed of the same parts which originally constituted it, and the heel is now finely and perfectly formed, though it was originally so small that a superficial observer would have said it was wanting in some parts, or irremediably deficient in size: this certainly requires explanation.

In one of the views of the distorted foot I have marked the position of the astragalus and os calcis, in the position in which they then lay; and, in the corresponding view of the restored foot, the position of those bones is marked in the same manner, to shew that it was the *position of the bones only* which constituted the deformity; and not any distortion in the form of the bones of the foot, according to the notion that has been commonly, though, as it now appears, without just foundation, entertained.

But the circumstance which should excite most attention, as it is, indeed, the most surprising part of the case, is the alteration in the length, the size and power of the gastrocnemii muscles and tendo Achilles. On measuring the restored leg from a point placed on a parallel with the patella, it proves to be three inches and a half longer than the deformed leg when measured in the same manner; a circumstance which, if merely related, in the terms that I have used, would by all be thought *wonderful*, and by most, perhaps, false; but, when fully explained, it is probable that the very wonderful part of the fact will disappear,

appear, though it is presumed that the fact, as it really is, will justly excite surprise.

Upon examining the model of the distorted foot, or the annexed views which have been correctly drawn from it, it will be evident that the astragalus was thrown forwards from under the scaphoid cavity of the tibia, without any derangement of its natural position relative to the os calcis; the os calcis was forced so far under the scaphoid cavity, and at the same time raised so high, that when the child stood upright on her feet, the os calcis actually was half an inch higher than the astragalus, when compared with the plane of the horizon: but when the foot was reduced to its natural state, the astragalus was forced under the scaphoid cavity, and, by the same operation, the os calcis was turned round, and forced downwards till it reached the ground and took its natural place, when by the new arrangement of the bones of the foot the form of that member was complete. This alteration of the position of the os calcis placed it about two inches lower, or, in other words, made the measurement from a level with the patella to the bottom of the heel two inches longer than it was in the deformed foot. This is the difference that would have been produced by the cure if the child had not grown taller during the progress of the cure: all the additional difference between the two legs is to be attributed to actual growth, as it appears on comparing the tibia of each leg in its original, with the corresponding one in its restored state, that the leg itself has grown so much during the time that has been employed in the cure.

But the great alteration, that which will excite the surprise of every well-informed man who thinks on the subject, is the alteration which actually did take place in the gastrocnemii muscles and tendo Achilles. By the alteration of position alone they have gained more than two inches in length, and the whole alteration, including the addition from growth, amounts to three inches and a half, and, from having always existed in a state of inactivity, and the tendo Achilles in consequence, being so weak as to be scarcely perceptible, they have acquired their full size, and the power of performing every natural action as well as if they had never been deranged or defective in any manner.

I have been particular in investigating this case, because no one can more completely demonstrate the real nature of the disease, or the efficacy of the means that have been used to cure it; nor, so far as we may be justified in reasoning by analogy, afford stronger presump-

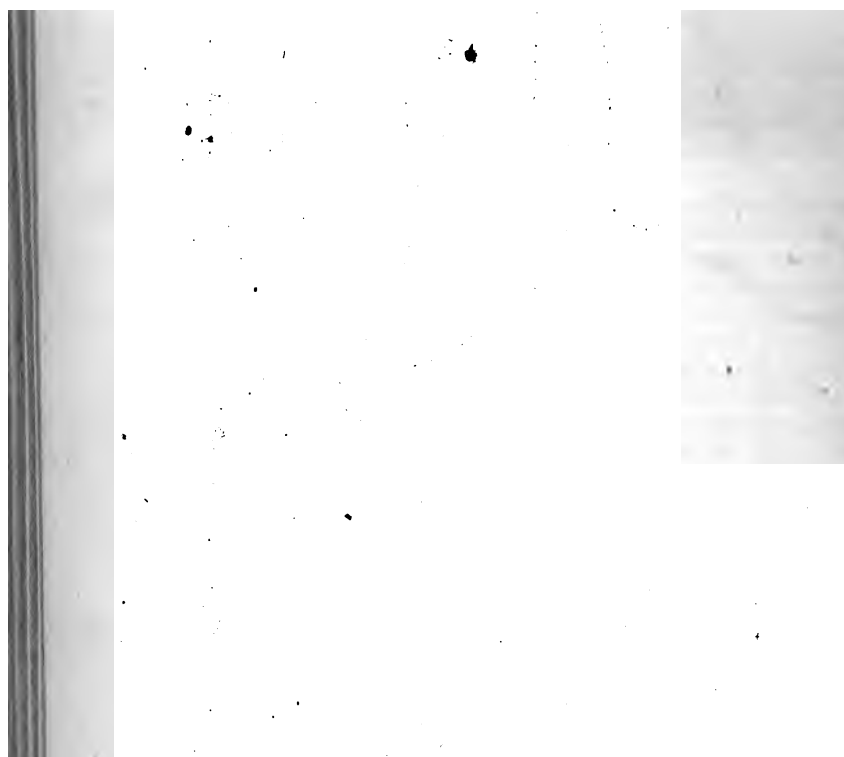
tive proofs that many other diseases which originate in similar defects of the human frame may be effectually cured by a skilful and appropriate adoption of those means which have been used with success in this case.

It may be useful too, in shewing the futility of those means which have been confidently proposed as infallible remedies for the cure of such distortions, by whomsoever they may have been employed. Professional men have always known that such diseases, if they were curable, could only be cured by the skilfull application of mechanical means, and, as such means have not been known, the diseases in question have seldom been regularly the objects of attention to professional men; quacks, and ignorant workmen have taken advantage of this circumstance, and proposed various methods of cure of their own invention; these, or such of them as have any speciousness in appearance, have been founded on the ideas of pressing, squeezing, or turning the limb into its natural shape; but it will be evident from the account of the preceding case, that something more than this is requisite to restore a limb, so distorted, to the natural state; a new arrangement of all the parts of the foot must be formed, and the parts, when naturally combined, must acquire the habit of performing new actions, and must be supported under those actions till they have acquired strength enough to support themselves; and, as this must be effected gradually, whoever undertakes to perform it with a probability of success must be well acquainted with the structure and functions of the parts; a kind of knowledge which does not fall to the lot of the pretenders who commonly engage in such undertakings, and frequently produce additional lameness by their ignorance instead of removing that which existed before they were employed.

CASE XIX.

Miss T. was born with one foot distorted; the distortion was said to have been originally slight, but her parents had been told that nothing could be done to cure it, and for that reason no attempt had been made. She had begun to walk at an early period, and continued to walk upon the outside of her foot, with her toes turned inwards, till April 26, 1800, when I first saw her; she was then five years old; the form and position of her foot are correctly represented in the annexed, pl. 5. Though the deformity was evidently considerable, there was much flexibility in
the





the foot, but she had no power of moving it, in obedience to the will. The requisite attention was immediately begun, and regularly continued till the latter end of December, when the foot was restored to its natural shape, and appeared to possess all its powers as much as the other foot. Though the leg was not, at this time, quite so large as its companion, it was thought unnecessary to keep this child's foot longer under any restraint, and all the bandages were removed. I have seen her several times since, and there has never been the least return of the distortion.

The circumstance most remarkable in this case was, that the power of moving the limb, in obedience to the will, was gained quite as fast as the form of the foot was altered; and it is perhaps to this circumstance we are to attribute the perfect restoration of the limb in a short time, compared to what is usually required to cure distortions that are no greater in degree, and in patients whose situations are in other respects equally favourable: for, it commonly happens that the feet are restored to their *form*, long before their natural powers are acquired; and the tedious attention required to affect this most important part of the cure, constitutes the great difficulty in the majority of cases.

In the annexed plate are given two views of the foot in its distorted, and two corresponding views of the same foot in its restored, state.

CASE XX.

Miss N. had one foot distorted, before the birth, very like the former case in appearance, though greater in degree, as her foot was rigidly fixed in the position represented in the annexed plate. She was two years old at the time she was placed under my care, May 3, 1800. The same system of treatment was pursued, and with the same regularity as in the former case; yet it was not until September 1801, that it was thought safe to withdraw the instruments and bandages, as her foot was then restored to its natural form, and to possess every power that was necessary to perform its office, without any appearance of lameness.

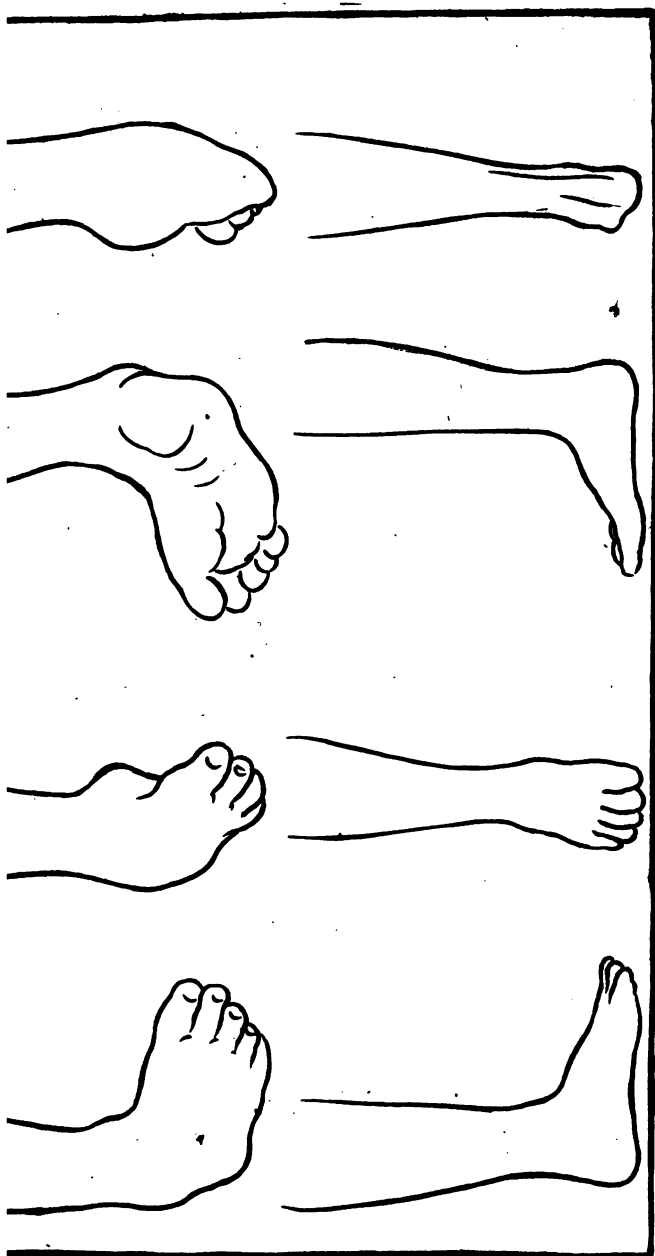
She was put to school, and about eight months afterwards it was perceived that her ankle was weak, and her foot again turned inwards occasionally. To prevent any relapse from this cause, it was thought advisable to make her

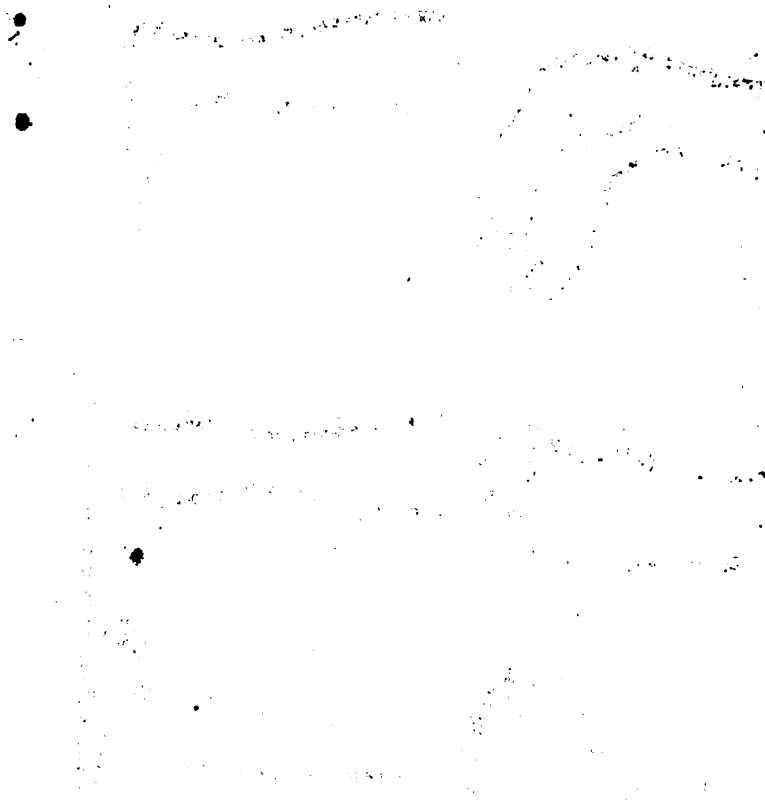
her wear an instrument to confine her foot in its proper position. This she continued to do without any inconvenience, when I saw her last in November 1803.

The annexed, pl. 6, contains four views of this child's foot in its distorted, and four corresponding views of the same foot in its restored, state.

CASE XXI.

Miss P. was born with one foot distorted, so as to resemble, in a great measure, the figures in pl. 1 of this work. Her parents lived at a considerable distance from London, and, with the assistance of a professional gentleman in their neighbourhood, got an instrument made by a workman in the nearest provincial city, from the use of which no benefit was derived. Similar applications were made to various workmen in London, but no advantage was obtained from any of the effects of their ingenuity; the child remained exactly in the same state till she was two years old, when, in September 1798, they placed her under my care. Due attention was regularly paid to the case till February 1799, when the foot was completely reduced to its natural form, and had no circumstance remaining to shew that it had been defective, except that when she was fatigued with exercise, her foot inclined to turn inwards. I wished to keep her under my care till this weakness was entirely removed; but family circumstances obliged her parents to return home, when they determined to take charge of her themselves, with what information I could give them with respect to the management of her foot. About twelve months afterwards they returned to London with her, when it was evident that the defect which remained when she was removed from under my care, had increased. There was an evident looseness in the ligaments which connected the bones of the foot, so that its shape might be easily altered by pressing it with the hand; but she still was able to use it in the natural way, except when she was fatigued. As they declined putting her under my care again for the same reasons as before, I could only advise that she should use a proper instrument, to prevent a still farther relapse, and when I heard last from her, she continued nearly in the same state.





CASE XXII.

Master B. was born with his left foot distorted, to what degree it is impossible for me to say, as his parents resided at a distance from London, and employed a gentleman in the neighbourhood to cure the defect, which he said he did perfectly, and relinquished the case; but it soon became evident that the child's foot was defective, and application was, in consequence, made to me in June 1802.

At this time the child was two years and ten months old; the appearance of his foot is correctly represented in the annexed plate 7, which is drawn from a model that was taken from the foot at the time he came under my care, and remains in my possession.

I was told that his foot was much more distorted when the child was born, that this distortion was diminished by the exertions of the gentleman who had been employed, to the state in which I saw it. The child had never had the power of moving his foot at the ankle joint, so as to raise it upwards, but he was able to bend it downwards; and this imperfect action was certainly injurious, as the tendency of it was to increase the defect by every exertion he made to use his foot. Upon examination it appeared, that the rigidity of the ankle joint prevented the foot from being extended beyond the state represented in the plate, and there was no evident power of motion in the flexor muscle of the foot, if the state of the ankle joint had rendered it capable of being moved, and the imperfect action of the flexor muscles would have again distorted the foot more speedily than if it had been completely rigid.

There was another circumstance which is material to be considered. When the parts are naturally formed, the fibula lies parallel to the tibia, the whole length of the leg is firmly connected with it by ligaments at the joint, and its extremity lies against the side of the astragalus, supporting and strengthening it in its situation and function, so as to render it very difficult to be luxated without fracturing the fibula. In most cases of varus that I have seen, the natural position of the bones of the leg has been preserved, though the astragalus has been thrown entirely out of its situation; but, in some, the fibula is thrown so far backwards, as to lie nearly against the back part of the tibia instead of the side: the consequence of this position of the fibula is, that when the foot is placed in its natural position,

position, the astragalus wants the support it should derive from the fibula, and the joint must always remain weak, and the foot liable to turn inwards. This peculiar state of the disease but seldom takes place till it is produced by injudicious attempts to apply pressure, with a view to squeeze the foot in its proper form, and by such attempts this additional derangement of the fibula takes place; sometimes to an extent that becomes absolutely irremediable, and necessarily leaving the ankle joint weak and imperfect; and, when this is not the case, adding to the difficulty of the cure, and rendering it infinitely more tedious. It is extremely probable that this derangement of the fibula was occasioned by the previous attempts to cure in this case, and certainly occasioned much additional trouble to rectify after it came into my hands.

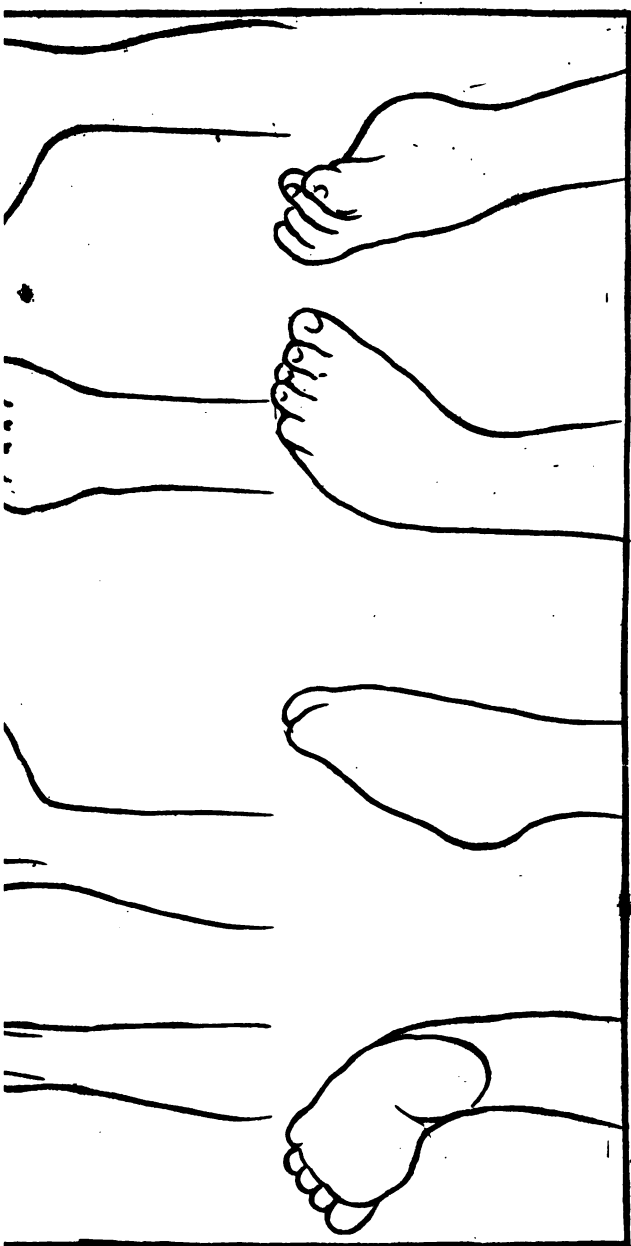
January 10, 1802, the cure was begun, and in March, 1803, the foot was perfectly reduced to its natural form, and capable of all the natural action, but remained weak, and likely to require support for a long time: but as his parents wished to take him home, they did so, and endeavoured to preserve his foot in the natural state by means of instruments they were supplied with. In this they did not succeed so perfectly as if the child had continued under my care; but I have lately been informed, that he has the perfect use of his foot, and is now quite well.

The annexed, pl. 7, represents the form and position of the foot at the time it was removed from my care, and the annexed measurements of the two models will shew the alterations in point of size as well as form, which took place during the cure.

	In the Diseased State. Inches.	In the Restored State. Inches.
Length of the foot measured from the heel to the extremity of the great toe	4	5½
Length of the leg from the patella to the extremity of the fibula, which forms the outer angle	7	7½
Ditto to the lowest part of the heels	7½	8½
Circumference of foot at the toes	5½	5½
Ditto round the instep and heel	6½	7½
Ditto of leg at the smallest part	5½	5½
Ditto at the largest part	7	7½

The cure in this case was effected in nine months. The annexed plate exhibits in one view four views of the model

Pl. 7.





model which was taken from the foot when first placed under my care, and four views of the model which was taken after the cure was complete. In making the drawings for this plate, I placed both the models in the same position; of course, the alteration in point of *form* is demonstrated upon the slightest inspection; but it may be necessary to investigate more particularly the nature of the alterations that were produced in the child's foot.

The leg, considered distinctly from the foot, appears to have gained a fourth part of an inch in length, which is certainly to be attributed only to the growth of the child, that leg having grown in the same proportion with every other part of the body: but every other alteration is certainly to be attributed to the actual cure of the deformity. The alteration in the *form* of the foot, the restoration of the ankle joint to its proper functions, by placing the astragalus under the scaphoid cavity of the tibia, and consequently altering the position of the os calcis, so far as to give the appearance of additional length to the heel, and thus actually adding one inch to the length of the leg and foot; and the addition of one inch to the length of the foot cannot be attributed to any other cause. The increase of the size of the leg is likewise to be accounted for in the same way; since it is always known in this disease, that the patient's leg diminishes in relative size, in proportion as he advances in life, and while the defect is permitted to remain, but regains its size in proportion as the power of motion and natural action is restored by the cure.

CASE XXIII.

Master H. was born with his right foot distorted. His parents lived at a distance from London, and had employed several professional gentlemen in their own neighbourhood. By some they had been promised a cure, by others they were told, the bones of the foot were deficient both in number and form, and *therefore* it was impossible that the child should be cured. Having tried every thing that was within their reach till the child was sixteen months old, though without success, they determined to send him to London, and place him under my care.

September 30, 1800, they confided him to my care. At this time his foot, in its general appearance, resembled that of pl. 1 in this work. There was a considerable degree of rigidity in it, and no appearance of voluntary

motion in those muscles which should lift the foot, but their antagonists were powerfully acting in contracting the it, and producing additional deformity; there was a peculiar irritability in the constitution, which greatly disposed the foot to inflammation, upon applying the pressure that was necessary to remove the deformity. This circumstance rendered the cure tedious, as much circumspection was required to avoid those inconveniencies which must have occurred, if much inflammation had been produced. It was not till near the end of the year 1802, that the foot was well enough to do without any attendance. At this period the foot was perfectly restored to its natural form, and its powers of acting in the natural manner, but it was weak, and not able to support the natural action for any length of time without sinking under it; for this reason it required to be supported by a proper instrument. This the parents chose to do for themselves, and for more than twelve months it continued well; but after that time, from the want of due attention in those who were about the child, it shewed some tendency to relapse, and there appeared to be a necessity for proper attendance, to replace the foot in its proper situation; but this was not done, the unfavourable symptoms disappeared, and the child continues well.

CASE XXIV.

Master D. was put under my care at the age of eleven months; he was born with his left foot much distorted, and many attempts had been made, in that part of Ireland where his friends resided, to cure him, but without success, and therefore he was brought over to me in June 1801. At this period the general appearance of his foot resembled that represented in plate 1, but on close examination it was apparent that the bones of the tarsus were not distorted with respect to each other, but the tarsus formed an acute angle with the bones of the leg, inclining the foot inwards, while the child stood upon the outside edge of the foot: another acute angle was formed by the metatarsus at its connection with the tarsus, the whole arrangement giving the foot the appearance of that curve, or particular distortion which is represented in plate 1.

No circumstance that was connected with the cure was unfavourable; in September 1802 he was removed from my care perfectly well, and has continued so ever since: in saying he was *perfectly* well it is to be understood that his

his foot was completely reduced to its natural form, that he was as able to use it as well as his other foot, but as it was weak he was directed to support it by a proper instrument for some time, this was afterwards removed, and he continued perfectly well the last time I heard of him.

CASE XXV.

Dec. 1802, Master W. was put under my care, he was then near three years old, had been born with his right foot distorted, in its *general appearance* very like Case 22, but not so bad in any of its circumstances; many attempts were made to cure it, though without any effect; and, at the time he was placed under my care, his foot was said to be in the same state as it was at the time of his birth: there was no unfavourable circumstance in the case, the cure proceeded regularly, and in the following September he was well: a few months afterwards some symptoms of weakness appeared, which induced a suspicion that he might relapse, but a little attention removed that weakness, and I have since been informed by his father that he continues perfectly well.

CASE XXVI.

May 16, 1801, Master B. was put under my care; he was then about eight months old, had his right foot distorted from his birth; in every circumstance it resembled the last case, and some ineffectual attempts had been made to cure it before it came under my care. In this, as in the preceding case, every circumstance was favourable, and in September following his foot was restored to its natural shape, and capable of acting in the natural way, but retained that weakness which always remains for a considerable time.

His parents lived at a considerable distance from London; it was very inconvenient for them to remain here till the child was quite well; and, as nothing more was necessary than to keep the foot in the state to which I had brought it, his mother imagined that she would be able to do so; she was supplied with the instruments for that purpose, and returned home.

When the instruments she carried with her were worn out, I was applied to for others, and informed, the child continued to do well. But some time after this, I heard he was not so well; again, that he was worse, *that the*

“ placed beyond the possibility of relapsing towards his former state: but it was necessary that I should return; he could not be sent with me; all that could, therefore, be done, after having placed him in a situation much better than his family expected to see him in, was to give the best instructions that were practicable, to enable his attendants to preserve the advantages that had been gained.

“ It must be remarked, that as the age of the patient, the degree of deformity, and the limited time I was to stay, were all unfavourable circumstances, I was stimulated to make every exertion possible, consistently with those circumstances, to effect a cure: I therefore proceeded, as rapidly as I could with safety, to reduce the feet to their natural form, and had the satisfaction to succeed, without any inconvenience, in less than two months. But this proceeding left the feet *peculiarly* weak; the muscles had not gained their natural power, it therefore required *particular* attention to keep the feet in their proper position, till that power was obtained.

“ Having provided for this attention in the best manner that our relative situation would admit, I was permitted to take my leave. This child was removed from my observation; of course, the subsequent attention was to be paid by those who had, no doubt, equal inclination to do him justice, but certainly not equal experience with myself. Could he have been permitted to remain with me, there is no doubt that the cure would have been perfectly complete, but at present I have no authority to say it is so.”

Unfortunately it did not prove complete; the distortion of both feet was bad, but the right foot was much the worst; the left foot remained perfectly well, but the right notwithstanding all the care that could be taken of it, relapsed, and became nearly as bad as at first.

In April, 1800, he was brought to London, and placed here under my care, where he remained till July 1801, when his foot appeared quite well, and he was thought well enough to go home. After his return he got a fever, which reduced his general strength, and visibly affected his foot, so that it again relapsed, and proceeded gradually towards its former state, but was not so bad as at first. In April 1804, he was again sent over, and his foot was again restored to its natural shape; and as he

he is now fixed in London for his education, and to continue under my observation, it is not at all probable that any future relapse should take place.

C A S E XXIX.

Master R. was born with his left foot distorted; the degree and peculiar circumstances of the distortion at the time of his birth could not be ascertained at the time I first saw him, October 1801, at which time he was four years old. His parents described the original state of his foot, as it appeared to them, and added, that from the time of his birth to that period at which he came under my care, they had tried every thing which regular practice as well as empiricism could suggest for his relief, but they had obtained no essential relief, though the appearance of the foot had sometimes been better, yet it afterwards relapsed again. At the time I first saw him, the foot was turned inwards, an acute angle being formed in that direction by the astragalus, at its junction with the tibia, the bones of the metatarsus, were likewise bent in a similar manner. With respect to the tarsus and the great toe, they were drawn upwards as much as it was possible to be by the permanent contraction of the extensor digitalis muscle: the fibula was likewise placed much *behind* its natural situation, so as to lie nearly on a line with the tendo Achilles. The general appearance of this foot very much resembled that of the plate annexed to Case XXXVI.

The cure of this case was much more tedious than the apparent deformity of the foot seemed to indicate, and the length of time required may be fairly attributed to the following circumstances: 1st. the derangement of the fibula from its natural situation, was a circumstance much more difficult to remedy in a patient of this child's age, and when remedied, left the foot weak for a longer time than it would otherwise have been, but it was, at last, effectually remedied; and 2dly. the *permanent* contraction of the extensor digitalis muscle presented an obstacle that could not be foreseen.

In another case I had met with the same circumstance, and had overcome it completely, having reduced the toe to its proper form, and restored to the muscle its natural action. As that patient was much older than Master R.; and in the same situation to all appearance, I was induced to believe, that the contraction of the toe was as likely

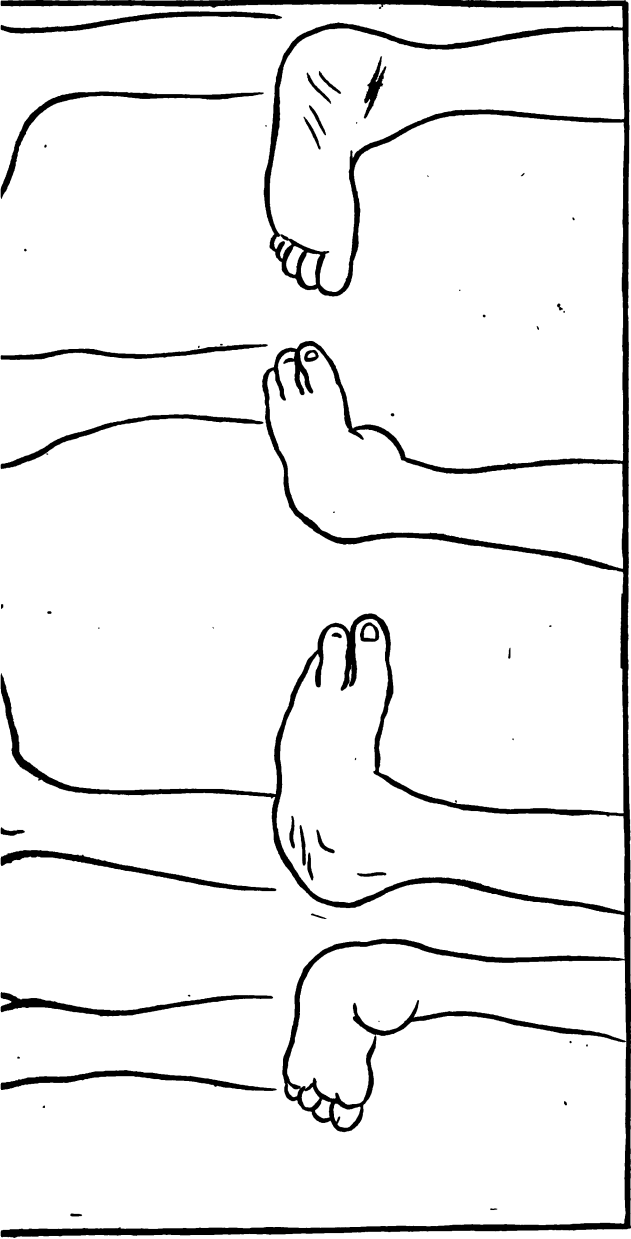
to be cured in one case as in the other. In this I was mistaken; Master R.'s foot was perfectly restored to the natural form in every respect *but the contraction of the great toe*, and obtained the full power of acting in the natural way, except so far as the natural action was impeded by that contraction. The foot remained so weak, that it was not till June 1803, that he could with propriety be withdrawn from my care, and he continues to use an instrument to counteract that tendency of the foot to turn inwards, which is occasioned by the deranged action of the extensor digitalis muscle, in consequence of its contraction.

CASE XXX.

Miss L. was born with her left foot distorted. Her parents were persuaded that no beneficial effect would result from any attempt to cure it, and therefore suffered her to go upon her foot as soon as she was able to walk, and she had continued to do so till I saw her, when she was eight years old. At this time the foot was turned completely inwards, so that she walked on the outer edge of the foot, the bottom of the os calcis on which she should have stood laying parallel with the inside of the tibia, and the circular head of the astragalus being on the outside of the leg, and laying more than half an inch nearer to the ground than the extremity of the fibula, which forms the outer angle; the bones of the metarsus were, individually, well formed, and perfect in their arrangement with respect to each other, but the whole metarsus formed an acute angle with respect to the tarsus; a considerable callosity had formed on that part of the foot upon which she stood, and the foot was entirely useless, except as a support to stand upon, as she had no power of directing its motion or moving any part of it, in obedience to the will. In April 1803, she came under my care; and in the following November, the foot was so far reduced to its natural position, that she could stand flat upon the bottom of it, and had acquired its natural form; she was capable of moving the toes, and even the foot itself, when she held it from the ground, and she was able to walk well upon it, while supported by a proper instrument.

So much having been done, there was every encouragement to persevere till a complete cure was obtained; but as they resided in a remote part of the kingdom, and family concerns required that they should return; and as
her

Pl. 8.





her mother misunderstood the child's situation, so far as to believe that nothing more was necessary to effect a complete cure, than to apply a simple instrument, which she imagined she was competent to perform, the child was taken from my care, and twelve months afterwards I was informed, that she continued in the same state as when she left me, i. e. her foot was well formed, but had no more power than it had when she left me. The fact then is, that with a foot well formed, instead of deformed, she is under the necessity of continuing to wear an instrument to support her, and in the nature of things, must continue to do so; when by persevering to obtain a complete cure, there can be no doubt that her foot would have been as complete, both in form and action, as her other foot was.

The annexed plate 8, contains four views of the distorted foot, drawn from a model that was taken from the foot at the time she was placed under my care; and four corresponding views of a model that were taken from the same foot when she was removed from me. The following variations, in point of size, have been measured upon the same models, which remain in my possession,

	In the Diseased Foot.	In the Restored Foot.
	Inches.	Inches.
Length of the leg from the patella to the ground as she stood -	12 $\frac{1}{2}$	13 $\frac{1}{2}$
Length of the foot -	6	7 $\frac{1}{2}$
Circumference of the foot at the toes -	6 $\frac{1}{2}$	6 $\frac{1}{2}$
Ditto round the heel and instep -	9	9 $\frac{1}{2}$
Circumference of the smallest part of her leg -	6	6
Ditto of the largest -	8 $\frac{1}{2}$	8 $\frac{1}{2}$

It is to be remarked, that all the variation, in point of size, between the two states of this leg, is the consequence of alteration in the form of the foot, by a different arrangement of the parts; there is no alteration from growth of the parts; the circumference of the leg is the same in both; and the circumference of every part of the foot is *nearly* the same in the restored as in the diseased state. The principal alterations are in the length of the leg, and the length of the foot, measuring on its bottom: the first was produced by bringing the circular head of the astragalus under the scaphoid cavity of the tibia, and the bottom of the os calcis on the ground, by which means

the patient stood upon the foot perpendicularly, instead of upon its side; and the difference between the height of the tarsus and its breadth will make the quantity which was added to the *apparent* length of the leg; and turning the metatarsus to a straight line with the tarsus instead of forming an acute angle with it, as it was in the diseased state, is the amount of the difference in the length of the foot. It is much to be regretted, that circumstances did not allow the cure of this case to be completed, as there is no doubt that it might have been.

CASE XXXI.

Master M. when about three years old, hurt one of his feet; the exact period when it happened was not noticed, nor was the nature of the accident accurately ascertained; all that his parents could tell was, that he suddenly appeared to be lame, without any cause whatever. In the ensuing winter, he got a very bad chilblain; and as he was one of those unfortunate beings, called spoiled children, who would do nothing, or submit to any thing but what suited his own sovereign will and pleasure, he obstinately refused to suffer any professional gentleman to dress it at all, and was permitted by his parents to remain the whole winter with his foot in a horizontal position, and with such dressings as he would allow his mamma to put on; he continued in this way till the approach of warm weather, when the chilblain became well.

His foot was then found to be permanently contracted, *nearly* in the position that is represented in the annexed plate; there was no voluntary motion in any part of the foot; he stood upon his toes, and could walk but very imperfectly.

Recourse was then had to various mechanics, who pretended to rectify the defect, but without success; the whole tribe of empyrics who pretend to cure such diseases were then tried, though in this case they did not succeed. It is but justice however, to say, that if the plans they adopted had been calculated to do good, the folly of the parents in indulging the child to excess, and the forwardness of the boy, would have effectually rendered them abortive. As a last resource, they applied to me in October 1801.

The child was then eight years old; his left foot was distorted in the manner represented in the annexed, *plate 9*. He stood upon his toes, and the foot was *rigidly* fixed
in

in the position represented in the plate; he walked with much difficulty, and was unable to take much exercise. I had no reason to doubt the possibility of curing the disease, but I did doubt whether the child would be so tractable as to allow the cure to be fairly attempted. Every promise of proper submission was given, and the cure was begun: For some time it went on well; but at length the insubordination of the patient's temper prevailed, and he would not submit to the proper treatment. I wished to retire, but the parents were unwilling to relinquish the hopes of a cure (to obtain which only required a moderate degree of resolution in themselves to enforce submission), they requested me to continue my attendance, and undertook to *persuade* the child to submit to the necessary treatment. In this way much time was wasted, and finding there was no possibility of obtaining submission from the patient, I finally relinquished the case. At this time I had a second model made from the foot, to shew exactly the alteration that had been produced. The three uppermost figures in pl. 9, represent the foot in the state it was in when it first came under my care; the figures immediately under them represent its appearance at the time I relinquished it finally.

The following are the comparative measurements of the two models:

	In the Original Disease. Inches.	In the Improved State. Inches.
Length of the foot - -	5 $\frac{1}{4}$	6 $\frac{1}{2}$
Circumference at the toes -	6 $\frac{1}{4}$	7
Ditto round the heel and instep	9	9 $\frac{1}{4}$
Circumference of the leg,		
smallest part - -	6	6 $\frac{1}{4}$
Ditto largest part - -	7 $\frac{1}{2}$	8
Length of leg from patella to the ground - - -	12	13 $\frac{1}{2}$

In comparing the preceding measurements it will be evident, that there is a sensible increase in the size of the leg, which may be partly attributed to general growth of the patient during the fifteen months which elapsed while the alteration was going on; but one part of it must have likewise been caused by the alteration of the foot, which brought the gastrocnemii muscles into action, and thus occasioned their enlargement.

The foot is likewise lengthened $\frac{1}{4}$ of an inch, principally from exertion, occasioned by depressing the arch of the

the foot, and bringing the tarsal and metatarsal bones into their natural position with respect to each other, as the foot acquires its natural form. But the most remarkable feature in this case is the position of the fibula. I have, in other cases remarked, that the fibula is sometimes forced backwards; I have never seen this peculiar circumstance in the earlier stages of the disease. In most cases that have come under my observation, it has always appeared in those where injudicious, forcible attempts have been made to squeeze, force, or compress the foot; so as to alter the form, that this peculiarity takes place; and when it does take place, forms of itself an unpleasant defect in the foot, and sometimes operates as an obstacle to the permanent cure of the original disease. If the outside view of the original diseased foot, pi. 9 be referred to, the particular circumstance now mentioned is not very visible; because if a line is drawn perpendicular in the direction of the bones of the leg, and to pass by the back part of the fibula, it will be seen that the os calcis is raised upwards, and thrown backwards so far behind the perpendicular line; that though the heel is (to use the common manner of describing it) both small and short, yet, the peculiar state of the fibula that has been mentioned may escape observation. But in the restored foot, where the astragalus is thrown into its proper situation under the tibia and the os calcis, of course, drawn down to the ground in its natural position, it then appears, that the extremity of the fibula is uncommonly large, and lies in a direct line with the tendo Achillis, on the back of the leg: the consequence of this accident is, that notwithstanding the astragalus is placed in its proper position under the tibia, it wants the support which it should derive from the fibula, to fix it in its place, and give strength to the ankle joint; and whenever this does happen, a considerable time must be employed to support the joint, till it has acquired strength to support itself; and even then, the enlargement and peculiar form of the fibula, will constitute an unpleasant deformity, which will then be irremediable.

The additional length of the whole limb is evidently to be attributed to the alteration of the foot. In the original, the os calcis lies nearly parallel to the fibula; but in the other, where the foot is restored, the same point of the os calcis lies almost two inches below the fibula, which fully accounts for the difference in the length of the whole limb.

CASE XXXII.

September 7, 1798, a nephew of Mr. Duryer, No. 16 Dean-street, Holborn, was placed under my care for the cure of one distorted foot; it happened before the birth; and from that period to the time I saw him, many unsuccessful attempts were made to relieve him. He was, at this period, seven years old; the toes were of the natural form, but the whole metatarsus was distorted at its junction with the tarsus, and the foot was so twisted from its natural position, that the toes pointed directly towards the opposite leg, and he stood upon a callosity which had been formed on the outside of the foot, upon the exterior cuneiform bone; the sole of the foot was exposed to view as he stood; the whole foot was perfectly rigid, and the leg much wasted.

In four months the foot was so much altered, that it might be placed in its natural position while he stood upon it, but it was incapable of any voluntary motion; when he endeavoured to walk, it hung an useless appendage to the leg, and immediately fell into its original position.

In eight months more the foot was so far reduced to the natural state, that he could walk upon it for a short time in the natural way; but as it remained weak, and there was, after some time, a visible tendency to relapse, it was again bound up, and continued so for ten months more, when the bandages were laid aside; and as, after six weeks trial, there appeared no tendency to relapse, I finally took my leave of the patient.

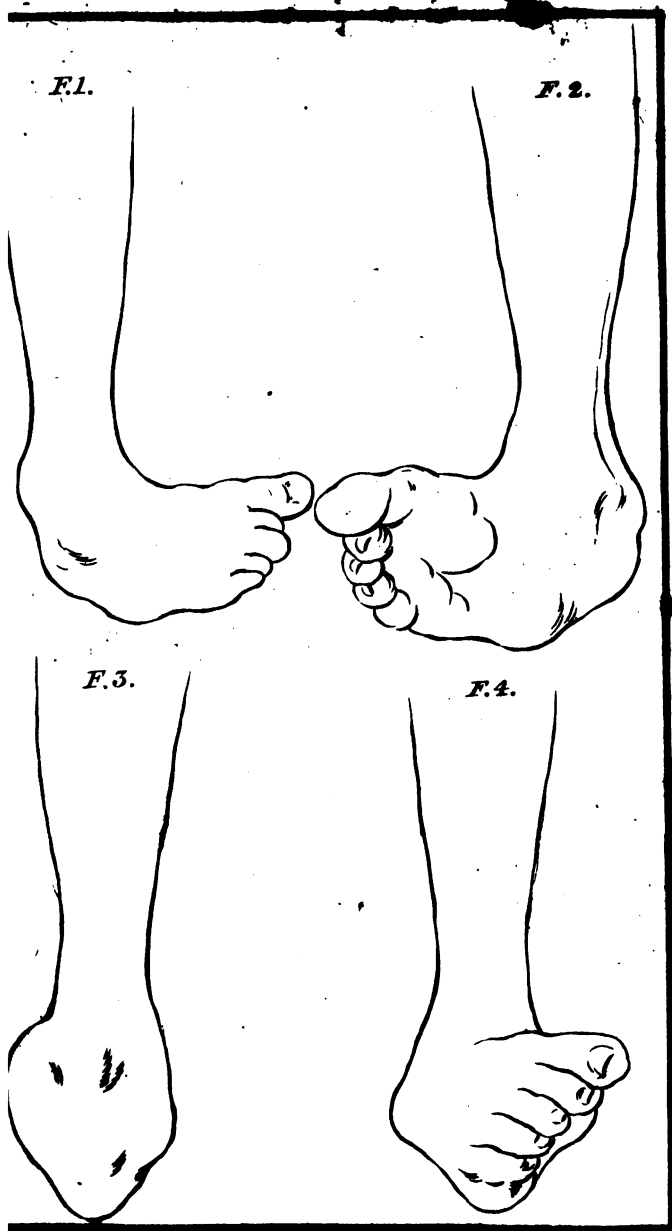
It would be very easy to say, in few words, that this patient was completely cured; and those, at least, who should see him walk flat upon his foot, and at the same time remember the state it was in, would not dispute the assertion; but as I think an accurate statement of the facts will be more satisfactory, I trust I shall be permitted to explain them.

I have one cast taken from the foot in its originally diseased state; a second, taken when it could be placed in the natural position, but remained flaccid and powerless, and therefore useless; a third, taken at the time he began to use the foot in the natural way; and a fourth, when I took my leave of him. By the assistance of these casts, instead of referring to my own memory, or that of the child's friends, the one of which might be thought partial, and the other could not show correctly what that disease was, which no longer exists, I am enabled to lay

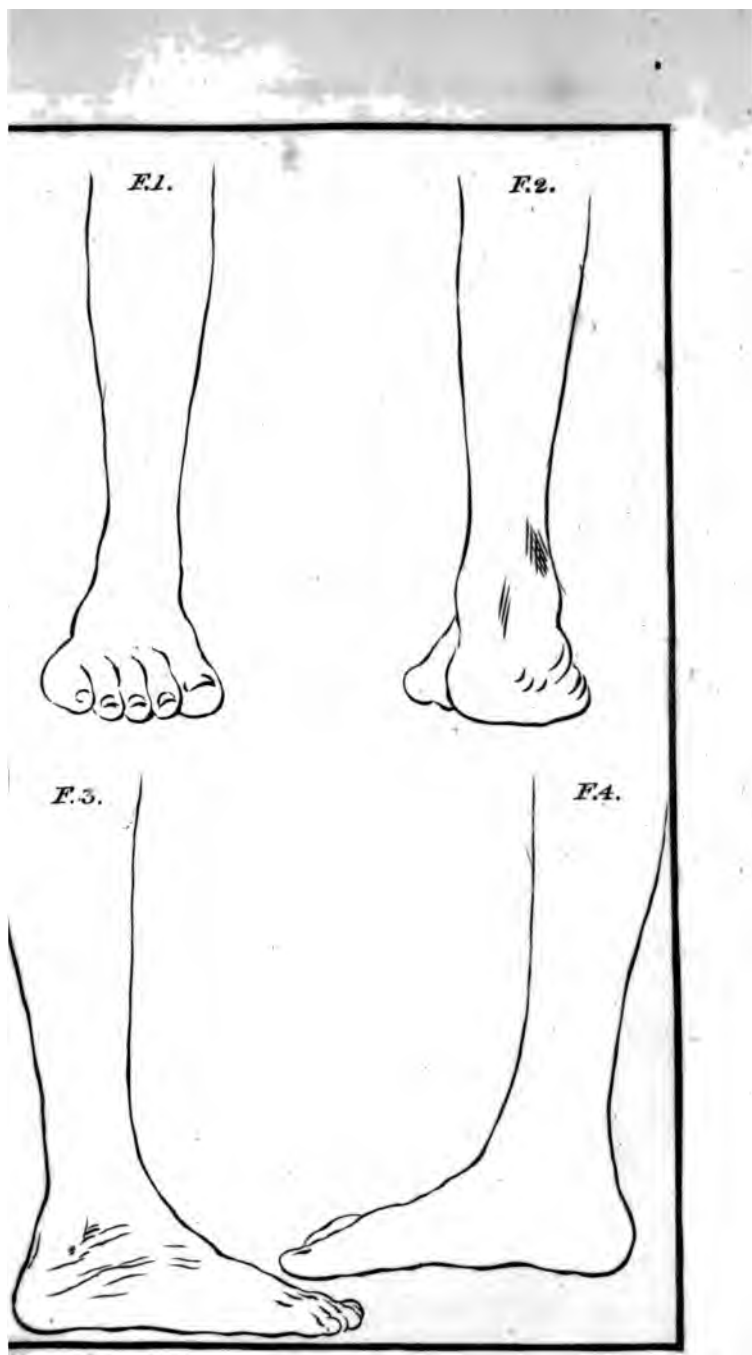
it before the reader in the most authentic and incontrovertible manner, by annexing correct drawings of the disease in its original, and the foot in its amended state. The plate marked 10, contains four views of the diseased foot; fig. 1, is a front view of the leg, to show how the foot was turned upwards and inwards with respect to it; fig. 2, a back view of the leg for the same purpose; fig. 3, a view of the outside of the leg, in which no part of the metatarsus appears, because it is turned directly inwards; and fig. 4, is an inside view of the leg, to show the position of the toes in that point of view.

Whoever is acquainted with the structure and natural position of the bones of the foot, will perceive immediately upon inspecting these views, that there was no distortion of the bones of the metatarsus, individually, or with respect to each other, but that the metatarsus began to form an acute angle, turning directly inwards at its junction with the cuneiform bones: in these again, there appears to have been little distortion, either with regard to their mutual connection, or their connection with the astragalus; but the astragalus itself was so far removed from its natural situation, that instead of its circular head lying in the scaphoid cavity of the tibia, it lay in a direct perpendicular line with the fore part of the leg: the os calcis, instead of being placed upon the ground, lay in contact with the back part of the tibia; and the scaphoid cavity of this bone rested upon those parts of the tarsus and the astragalus, by which they were joined together: the result of this combination was, that the patient stood, and could walk, only upon a callosity which was formed upon the outermost cuneiform bone. Add to this, that the distortion took place before the birth, and by remaining in this state till the patient was seven years old, the whole mass was so firmly connected, as to be perfectly rigid, and no part of it seemed endowed with any capacity for locomotion: any attention to these circumstances will be necessary, when we come to consider the treatment. Plate 11, contains four views of the leg, taken from the cast which was made after I quitted the patient. In making these views, I placed the leg in the same positions as in drawing the figures, with corresponding numbers in the former plate; of course, a comparison of the two plates will show exactly the difference between the foot in its diseased, and in its amended state.

I have only taken the extremes of this case, as the best method of showing the full effect of the alteration produced;









produced; it would be needless to give drawings of the intermediate casts of the foot, though it may be proper to observe, that in the second state of the case, when the foot could be placed in the natural position, but had no power to retain itself in it, it fell nearly into the form of the original disease, but the skin remained loose, and was universally wrinkled; in the third state, it approached nearer to the natural form, but still it had some distinguishing peculiarities; the instep was much higher, the shape of the ancles was not so well defined, and there was much loose skin about the ancle and outside of the foot; this afterwards disappeared; and when the last cast was taken, the foot measured five-eighths of an inch more in length than it did when the one before it was made. As this is more than can be accounted for from the natural growth of a natural formed foot in the space of ten months, the surplus must be attributed to the alteration produced in the general state of the foot during the progress of the cure.

I have hinted that this foot cannot be said with propriety, to be perfectly restored to its natural state. If fig. 2 and 3, in pl. 11, are examined, it will be seen that that part of the fibula which forms the outer ancle, is removed from its natural situation, and is quite close to the tendo Achillis; though this peculiarity does not render the foot unserviceable, it certainly will never occasion the leg to be admired for its beauty, and in this case I believe it to have been irremediable, though I have succeeded in removing that, as well as every other defect in younger patients. I believe it must have happened in the following way.

The fibula, from its length and position on the side of the astragalus, guards the joints so securely from luxation outwards, that Mr. Pott said, it was an invariable rule that this joint could not be so luxated without fracture of the fibula; perhaps he may be right: but it is certain that in this and similar cases, where the distortion takes place while the bones are in a cartilaginous state, the head of the astragalus, by pushing forwards, first drives the fibula outwards, and then forces it backwards towards the tendo Achillis. To render the cure in this kind of case perfect, it ought to be undertaken while the bone is in a cartilaginous state; in this state I have several times cured it entirely: but in the case I have just related, I could not succeed in removing that particular defect, though it may not hereafter, in other cases perhaps, prove irremediable.

CASE

CASE XXXIII.

In the beginning of January 1798, Mr. Pugh, who then resided in Percy-street, requested me to see a patient at his house; he was a youth of eleven years old, a native of Moscow, and had been born with the left foot distorted; every thing that the state of science, in his own country, could suggest, had been tried in vain; he then came to London, and was confided to the care of Mr. Pugh, who desired a consultation with Messrs. Cruikshank and Wilson; Mr. Pugh proposed to have the tibialii muscles and aponeurosis plantaris, or such parts of them *as he thought* were contracted, divided; after which, he said, *he imagined* he could complete the cure; this was objected to by the two gentlemen, and Mr. Wilson advised that I should be consulted.

Dr. Grieve, Mr. Pugh, and the patient's uncle, were present when I examined the foot. I had reason to believe it was a case that I could cure; but I felt it would be indelicate to propose, that the patient should be taken from Mr. Pugh and confided to me, I therefore only said, I thought he might be much benefited by what I could do for him; and it was agreed that I should do what I thought right, Mr. Pugh at the same time continuing to treat him in his way. But, in a private conference with Mr. Pugh, after the patient and his friends had retired, I desired to know *his opinion* of the case? He thought the patient might be benefited, but had no conception that a cure was possible; I declared, unequivocally, my conviction that he might *be perfectly cured*; but, I added, it must be by means only known to myself, and by my own application; that I had not mentioned this, from motives of delicacy, before the patient and his friends, but thought it right to inform him, I should do nothing unless the patient was left entirely to my management; and if this was not agreeable to him, I should decline interfering, and consider myself as withdrawn from the case.

Mr. P. was delighted to hear that I thought a cure was not impracticable, and laboured ardently to persuade me to *inform him* of the method I should use, and put *him* in possession of my instruments; but finding me inflexible, he, with *the affectation of much liberality*, declared he only sought for the patient's benefit, and therefore consented that I should proceed in my own way.

But ere I was prepared to begin, the uncle called upon me; he apologised for the disagreeable step he was going

going to take, but added, that Pugh had desired him to prevent me from doing any thing, as some ideas had occurred to him, which he hoped would be beneficial to the patient, and he accordingly did satisfy me for my trouble, and the case was again left to Mr. Pugh.

In the beginning of February, however, the same gentleman applied to me again; I learned, that during the time that elapsed since I last saw him, Mr. Pugh had not only repeated his former practice, but he had introduced some workman who made an instrument that could not be applied, he therefore was now determined to trust the case entirely to my management.

At this time I had a cast in plaster of Paris made from the foot; this cast remains in my possession, and will demonstrate that the facts were as follow:

The foot was perfectly rigid, and he was incapable of moving it voluntarily in any direction; though, when he stood upon it, the little toe only touched the ground, and then the ankle joint bent a little under him, yielding to the weight of the body, and, in consequence of this action, becoming gradually more deformed: the head of the astragalus projected much before the tibia, the tarsal bones formed an acute angle with respect to the tibia, and bent inwards: the metatarsal bones likewise formed an acute angle with respect to the bones of the tarsus; there was no voluntary motion in the toes, and the tibialii muscles and plantaris aponeurosis *seemed* to be permanently contracted. The knee, in consequence of the imperfect action of the foot, had bent considerably inwards.

He continued under my care till June 19, in the same year, when it was necessary that he should return to Russia; at this time I had a second cast taken from the foot, which, as well as the former, remains in my possession, and will demonstrate the following facts, viz.

He stood perfectly flat on his foot, instead of bearing only on the little toe, the top of the foot forming a right angle with the leg as much as any other foot does: the head of the astragalus had regained its natural position under the scaphoid cavity of the tibia; the bones of the tarsus had regained their natural position relative to the leg, and the metatarsal bones had almost got into their natural position: the consequence of all this was, that the foot had acquired a form nearly resembling the natural foot, and actually measured seven-eighths of an inch *more in length than it did when I first saw it, four months before this period.* The plantaris aponeurosis and tibialii muscles had

lost

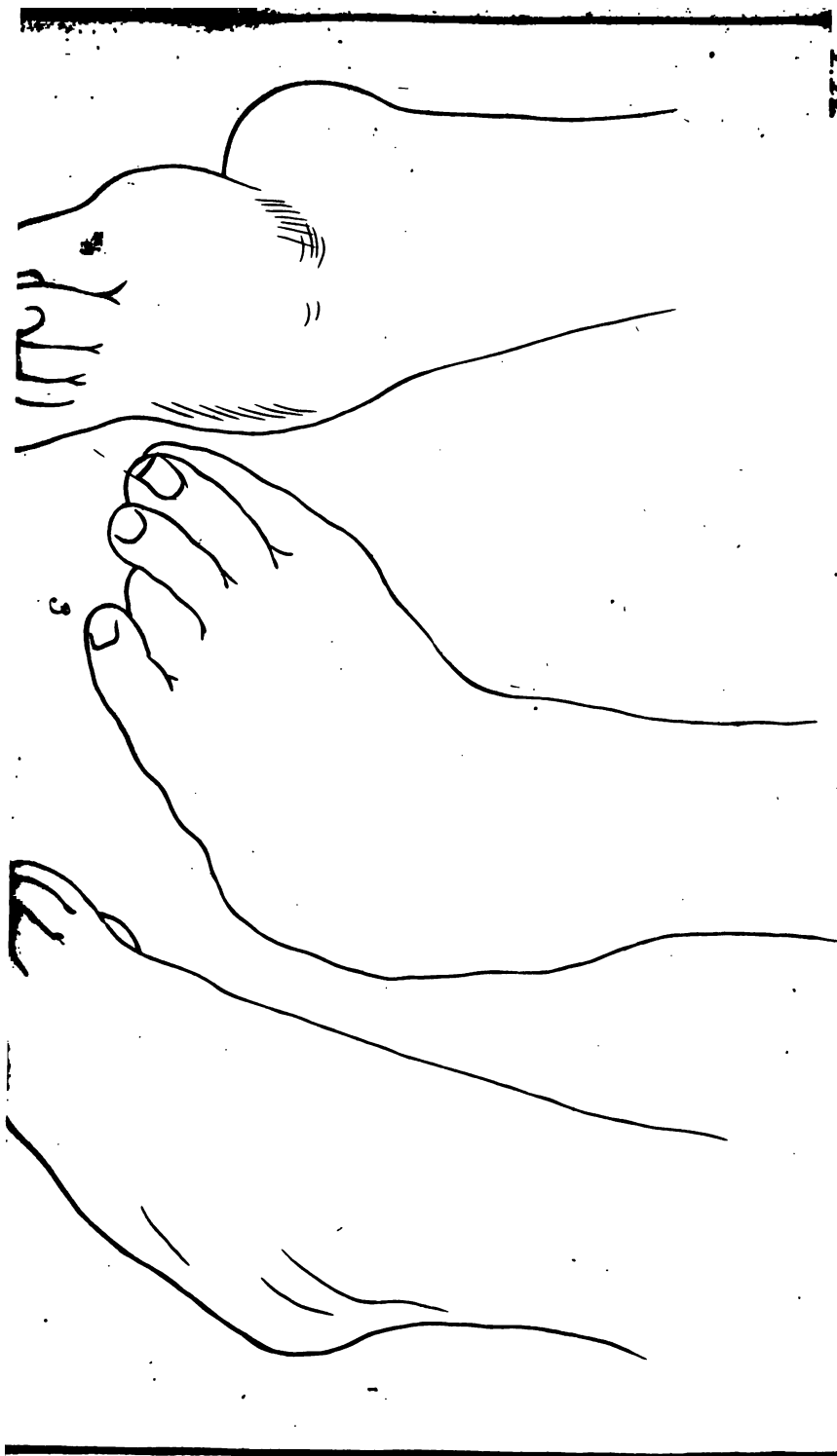
lost their apparent rigidity, and, as well as the tendo Achilles, or rather the gastrocnemii muscles, which move it, had acquired the power of acting in the natural way; the peronei muscles, as well as those which move the toes, had acquired their natural action, and he was, in consequence, enabled to move the foot in every direction, and in perfect obedience to the will.

So much having been done in this case, there was every reason to believe the cure would have been perfect in every sense, had he continued longer under my care; but it was indispensably necessary that he should return to Russia; and it was hoped that what little was still wanting to complete the cure, might be affected by means of the instruments with which I supplied him. His tutor, an intelligent man, who paid particular attention to the instructions I gave him, undertook the charge; I have since inquired of Mr. N. the patient's uncle, who is still in London; and from him have received the following letter:

MONSIEUR,

Oct. 15, 1800.

Ayant lu la description que vous avez fait de l'état dans lequel le pied de mon neveu se trouvoit avant qu'il fut remis entre vos mains et de la différence très-marquée, que le succès des soins et des moyens que vous avez employés y avoit déjà porté; lorsqu'à mon grand regret, forcé par quelques circonstances particulières, je me vis obligé de le renvoyer dans sa patrie, et de faire cesser, ainsi, son traitement. Je croirois, Monsieur, totalement manquer aux sentimens de justice, et à ceux de la réconnoissance pour le bien que vos soins ont rendus à un jeune homme qui m'intéresse, si je ne saisissois pas, avec empressement l'occasion que vous m'offrez de satisfaire au désir que j'ai toujours eu, de rendre à vos talents un témoignage aussi public que possible; guidé par ce sentiment, ainsi que par l'amour de la justice, je déclare que tout ce que j'ai lu dans la memoire que vous m'avez fait l'honneur de me communiquer, porte, en general, et sur tous ses points, le caractère de la plus stricte vérité; et que, de mon côté, je n'ai pas le moindre doute que s'il eut été possible de le laisser plus long-temps entre vos mains, sa jambe rentreroit entièrement dans son état naturel. En effet, Monsieur, je crois que l'évidence des faits m'autorise de le supposer; car, lorsqu'après m'avoir séparé de lui pour quelques mois, je le revis à Hambourg, par où il passoit pour rentrer dans son pays, je ne fus pas peu surpris de le voir poser sa jambe sur la plante du pied, et d'une manière qu'il ne resteroit









resteroit rien à désirer une fois que le vice du genou, successivement produit par le poids du corps, qui, dans son état, devoit nécessairement porter à faux, seroit enlevé : et, en examinant la dernière machine que vous fîtes pour lui et dont il devoit continuer à s'en servir, j'ai cru avoir toutes les raisons possibles de former les plus flatteuses espérances que ce dernière moyen remédieroit à ce mal, avec le même succès qu'ont eu les premiers. Je suis fâché, pourtant, que malgré toutes mes instances pour avoir quelques détails sur la suite des effets qu'a produit l'application de cette dernière machine, je ne puis obtenir d'autres réponses, que celles, où l'on me disoit vaguement, que sa jambe alloit beaucoup mieux. Je le répète encore que, pour ma propre satisfaction ainsi que pour la votre, j'aurois bien désiré pouvoir être en état de vous en rendre un compte plus circonstancié ; mais, en attendant que je sois à même de le faire, je ne suis cependant pas peu flaté de pouvoir vous rendre toute la justice qui est en mon pouvoir, comme un tribut de la reconnaissance avec laquelle j'ai l'honneur d'être,

MONSIEUR,

No. 71, Warren-street,
Fitzroy-square.

Votre très-dévoué,
N. de NOVASSILZOFF.

It will, perhaps, not be unreasonable to conclude, that ere this the patient is *perfectly* well ; but as I wish to avoid every thing that may afford the least pretence for doubt or contradiction, I shall confine myself to such facts as are capable of being satisfactorily demonstrated.

I have said I caused one cast to be made from the foot before any thing was done, and another at the time I took my leave of the patient ; these casts are in my possession, and I have made three drawings from each of them, placing them as nearly as possible in corresponding situations ; these views are annexed, and will convey an accurate idea of the state of the foot at the periods when it was within the sphere of my observation. Mr. N.'s letter describes what was his situation some months after he left me ; and from the combined effect of this evidence, the reader will form his own conclusions.

In making my drawings of the original disease, I have placed the leg quite upright, and the foot falls into the situation it was in when he stood upon it : in pl. 12 there are three views of the foot in this state ; No. 1, looking directly upon the inside of the leg ; No. 2, upon the outside of the same ; and No. 3, a front view of the leg. The appearance

pearance of the foot in each of these views, will, I think, shew very intelligibly the actual state of the distortion.

In drawing the foot after it was cured, I have pursued the same plan; that is, in pl. 13 there are three views; in making which, I placed the leg in exactly the same situation as I did the former; by comparing them, the improved state of the foot will, I think, be clearly understood.

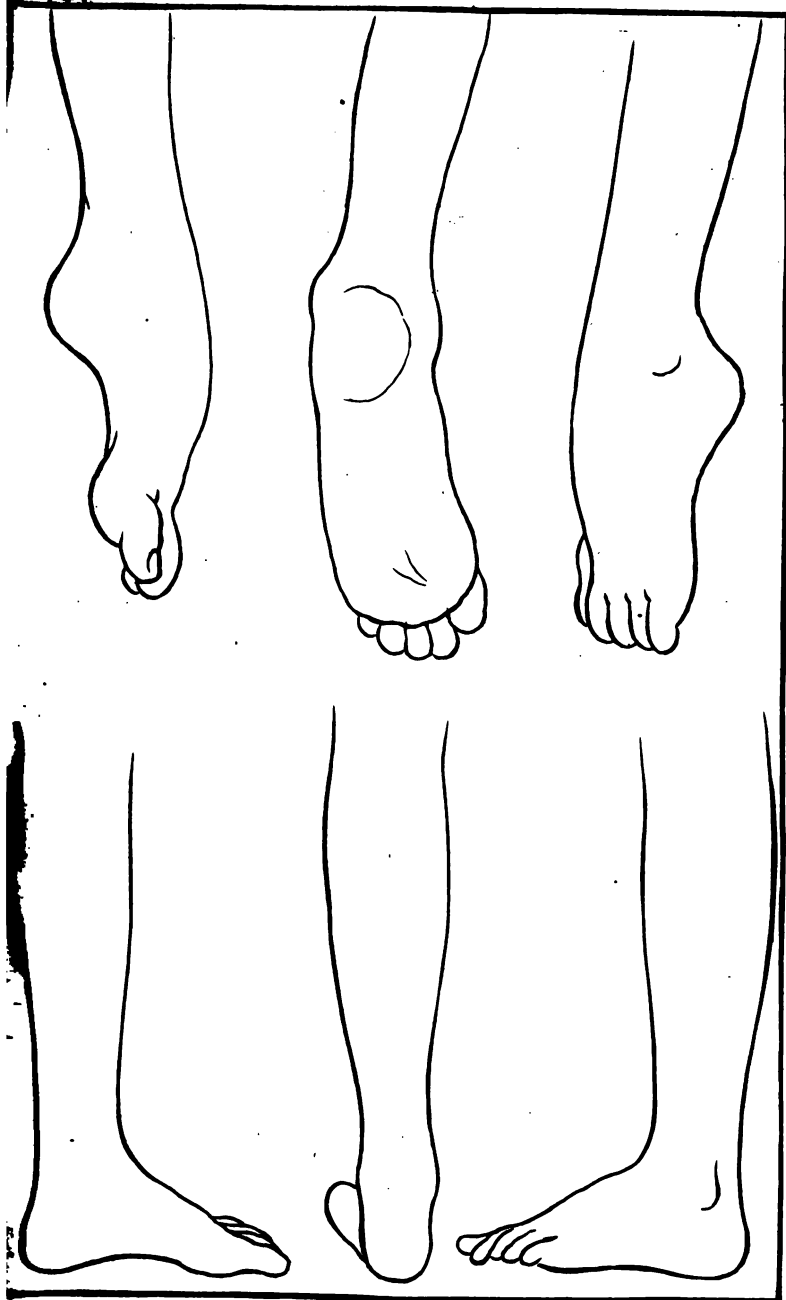
In No. 1, being the inside of the foot, there appears not the least deformity; in No. 2, the appearance is not so perfect; and in No. 3, there is the additional disadvantage of shewing a fore shortened view of the foot: but these shew all the deformity then remaining, viz. that those bones which form what is commonly called the instep, are something higher than usual.

At the time this patient was entrusted to my care, I had treated none who were by many years so far advanced in life. The circumstance which then seemed to me remarkable, as it distinguished this from every case that had been under my care, was the following: In young subjects, the reduction of the feet to their natural form is effected long before the power of using them is acquired; but in this case, these two effects were produced at the same time; whence we are justified in concluding, that if those trifling peculiarities which remained when he was taken from under my care, were not afterwards removed, notwithstanding those imperfections, his foot is in every respect as useful as the other; but if we are to assume, as most probably is the fact, that they have since disappeared, the cure is in every respect complete.

CASE XXXIV.

Master L. when aged between two and three years, was placed at nurse in the country; in this situation he met with some accident which the nurse either could not, or would not explain; but his friends perceived that he had contracted a lameness in his left foot, of which they could get no kind of account. Medical advice was applied for, but no benefit received; his lameness increased, and his foot became deformed as he grew up; the assistance of empirics was sought after, as well as that of regular practitioners, but in vain: the case was abandoned as hopeless, till at last he was placed under my care. At this time, July 1800, he was ten years old, his foot was so distorted, that he stood upon his toes, the astragalus projecting on the front of the foot, which was incapable of voluntary

P. 14.





voluntary motion, and perfectly rigid when any attempt was made to place it in its natural position, but yielding under the weight of the body when he stood upon it, and thus becoming more deformed by his unavoidable attempts to walk upon it.

In attempting to reduce this foot into its natural formation, the patient's feelings were so acute, and the irritability of the limb was so great, that it became indispensably necessary to proceed slowly in the reduction, to avoid creating high inflammation and its consequences in the foot. In July 1801, his foot was reduced to its natural form and position, had a considerable degree of voluntary motion, but was, evidently, still very weak: it was, however, supposed that, as he had the *power* of directing its motion, that the foot would acquire strength by exercise, and therefore farther attention would be unnecessary, and for these reasons he was removed from under my care.

In about four months it was perceived, that he was less capable of using his foot, it became more rigid, and was relapsing towards that state of deformity from which I relieved it: it was again committed to my care, and remained with me till the end of the year 1802, when I finally relinquished the case, his foot being perfectly reduced to its natural form, had acquired power equal to the other foot, and though it was something smaller when accurately compared, was by no circumstance distinguished from it when his shoes were upon them.

In August 1805 I saw him, and he continues perfectly well in every respect.

When placed under my care in 1800, I had a model taken from his foot, and another in 1802, when he was removed from my care. The annexed, pl. 14, contains accurate delineations of both these models, by which the original state of the disease, and the actual state of his foot may be perfectly understood. The following correct measurements of both the models are subjoined.

	In the Distorted Foot. Inches.	In the Restored Foot. Inches.
Length of the foot from heel to the end of the great toe -	7	8½
Circumference at the toes -	8½	9½
Ditto round the instep and heel	10½	12
Ditto round the smallest part of the leg	7	8
Ditto round the largest part -	9½	12
Length of leg from patella to the ground	15	18½

ward cramps, that such distortions can prove by accident; or, if they could be so gradually induced that could occasion so great alteration of the parts, would likewise produce a degeneration in sleeping in its appearance, and the it diminished, that attention would necessarily and then such measures would be adopted as usually prevent distortion, so serious, from consequence is plausible, but certainly not true, at least, as the father of this boy was convinced that his son had the perfect form and use of still he was two or three years old; the fact is assumed to be true; and if the probable circumstances that might lead to the distortion absent, we may be permitted to suppose that they may produce similar effects in many other cases.

A very slight luxation, or a strain so slight produce inflammation or swelling, might make foot uncomfortable, and him unwilling to walk; a nurse might neglect this, or if a careful nurse worth her notice, and asked such advice as was reach, as she could give no account of any accident had happened, she might be told it was a temporary inconvenience that would soon disappear; if she was she might carry him, or she might be advised the child to walk upon his foot till it was well; inflammation thus produced, would increase the deformity of the foot; by being kept pendulous, its form would

in any case, it is where inflammation is produced in the

The axiom, that muscular motion produces or increases muscular strength, and the size of muscular parts proportionate degree, has been long understood, but not to the extent that is proved by this case; if it been asserted, *a priori*, that the leg of any person might, by mere exertion of continued action be increased $2\frac{1}{2}$ in circumference, in the course of something more than two years, it would have, openly or covertly, been held as a fabulous exaggeration; yet, in this case it only happened, and the same thing has happened so lately in similar cases that have been under my care, it may, safely, be supposed to be the general consequence of the means that have been used to stimulate the parts.

It is remarkable too, that the tendons are increased in size and power, quite as much as the muscles, though it is not, *a priori*, be thought that they were so, if at all susceptible of this kind of alteration. In this case the tendo Achilles was small, and to appearance most per-
rigid, the extensor tendons of the toes were incapable of the least motion, and for that reason, as well as their small size, they were not visible through the skin; they are now equal in size to the tendons of the other leg, and the whole of the leg is equal in size to its fellow, and equally capable of every kind of exertion; there is no circumstance that can now distinguish this leg from his right; but the foot, though increased so much in length as has been related, is still shorter than the other foot, but this difference is entirely concealed by his shoe.

CASE XXXV.

Master C. was born with his right foot distorted; the instruction given by his parents was but vague; the foot was thought to have been twisted inwards, and was much distorted, as undoubtedly a case of varus, but the degree of deformity cannot now be ascertained: many attempts were made to cure it, which were so far successful, that he was enabled to stand with the bottom of the foot upon the ground; but much deformity, and a considerable degree of lameness remained.

When about thirteen years old, he was placed under my care. At this time his legs were of equal length, his right

As the circumstances of this case prove many facts, the truth of which has been doubted, disputed or denied, and prove them more strongly than any that had previously come under my notice, it may be thought excusable, at this time, to point them out to the reader's observation.

Many who have seen distortions similar to this, but which have taken place before the birth, have been forward to assert, that such distortions can never be produced by accident; or, if they could be so produced, any accident that could occasion so great alteration in the form of the parts, would likewise produce a degree of inflammation so alarming in its appearance, and the consequences it threatened, that attention would necessarily be excited, and then such measures would be adopted as would effectually prevent distortion, so serious, from coming on. This argument is plausible, but certainly not true, in this case at least, as the father of this boy was competent to know that his son had the perfect form and use of both his feet, till he was two or three years old; the fact may be safely assumed to be true; and if the probability of circumstances that might lead to the distortion is made evident, we may be permitted to suppose that similar causes may produce similar effects in many other cases besides this.

A very slight luxation, or a strain so slight as not to produce inflammation or swelling, might make the child's foot uncomfortable, and him unwilling to walk: a careless nurse might neglect this, or if a careful nurse thought it worth her notice, and asked such advice as was within her reach, as she could give no account of any accident that had happened, she might be told it was a trifling inconvenience that would soon disappear; if she was indulgent, she might carry him, or she might be advised not to suffer the child to walk upon his foot till it was well; a state of inaction thus produced, would increase the debility of the foot; by being kept pendulous, its form would be deranged, or it would be equally deranged by the deranged action of its parts if it was used; its action being impeded, its substance would waste, and it would go on progressively till its natural form was totally altered, its substance wasted, and all its powers of action being destroyed, it would in the end become as rigid as if all its parts were ankylosed, though, in fact, it will be found, that ankylosis never takes place in any case of this kind; if it does

does in any case, it is where inflammation is produced in the joints.

The axiom, that muscular motion produces or increases muscular strength, and the size of muscular parts in a proportionate degree, has been long understood, but perhaps not to the extent that is proved by this case; if it had been asserted, *a priori*, that the leg of any person might, by the mere exertion of continued action be increased $2\frac{1}{2}$ inches in circumference, in the course of something more than two years, it would have, openly or covertly, been treated as a fabulous exaggeration; yet, in this case it certainly happened, and the same thing has happened so frequently in similar cases that have been under my care, that it may, safely, be supposed to be the general consequence of the means that have been used to stimulate the action of the parts.

It is remarkable too, that the tendons are increased in size and power, quite as much as the muscles, though it would not, *a priori*, be thought that they were so, if at all, susceptible of this kind of alteration. In this case the tendo Achilles was small, and to appearance most perfectly rigid, the extensor tendons of the toes were incapable of the least motion, and for that reason, as well as from their small size, they were not visible through the skin; they are now equal in size to the tendons of the other foot, and the whole of the leg is equal in size to its fellow, and equally capable of every kind of exertion; there is no circumstance that can now distinguish this leg from his other; but the foot, though increased so much in length as has been related, is still shorter than the other foot, but this circumstance is entirely concealed by his shoe.

CASE XXXV.

Master C. was born with his right foot distorted; the account given by his parents was but vague; the foot was said to have been twisted inwards, and was much distorted, it was undoubtedly a case of varus, but the degree of deformity cannot now be ascertained: many attempts were made to cure it, which were so far successful, that he was enabled to stand with the bottom of the foot upon the ground; but much deformity, and a considerable degree of lameness remained.

When about thirteen years old, he was placed under my care. At this time his legs were of equal length, his
right

right leg much less in circumference, in every part, than the left; the foot was smaller and shorter; he stood upon the bottom of his foot; it is true, but the tendo Achilles appeared to be rigid, and the muscles which are attached to it were incapable of moving the foot in the natural way; he was unable to lift his foot upwards, or turn it outwards; in short, the peroneus longus, and extensor longus digitorum pedis were incapable of acting. In consequence of this defect his foot turned much inwards, and from the apparent contraction of its extensor, the great toe was raised upwards, and the arch of the foot shortened and raised much higher than it is in a well formed foot.

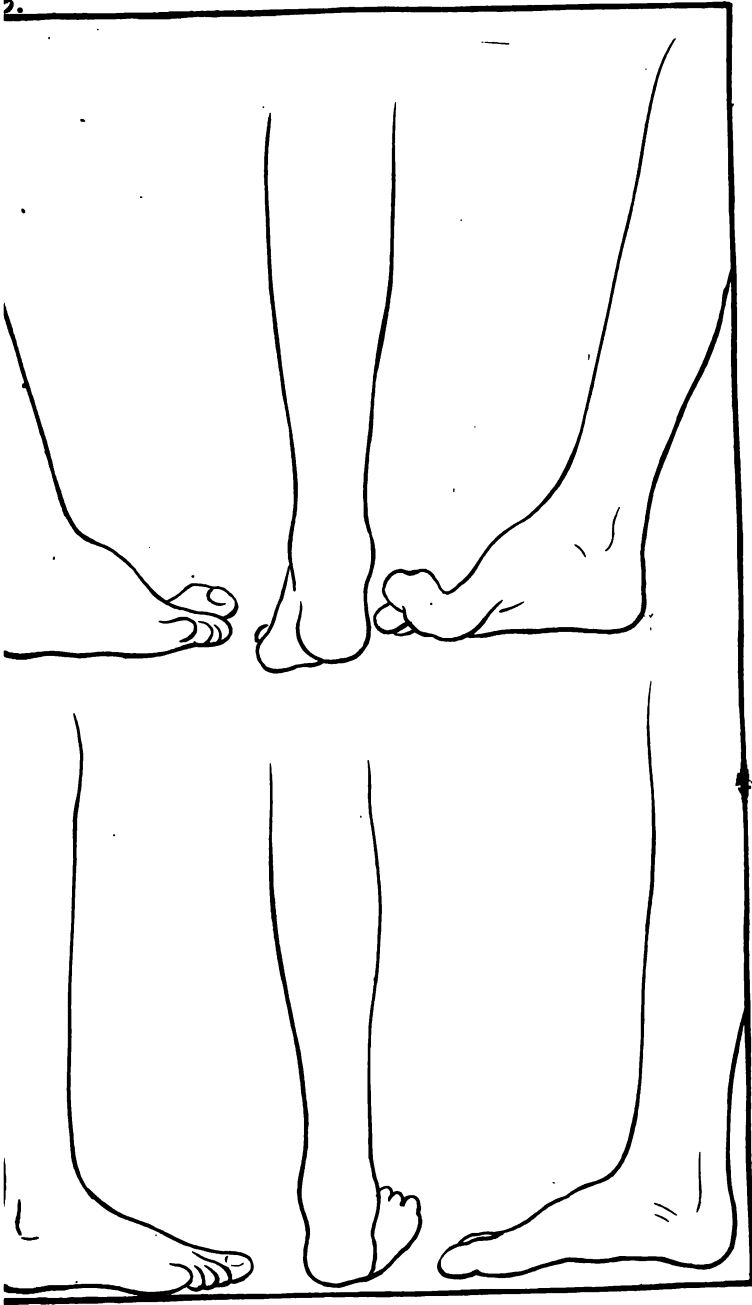
He was placed under my care in April 1802, and in December, the same year, his foot was perfectly reduced to its natural form, all the muscles had acquired the power of acting perfectly well in the natural way, and no appearance of lameness remained; but there was a considerable degree of weakness in the foot; it was necessary that he should return to his friends in the country, and he was advised to use proper means to support the foot under the exercise it was necessary for him to take, till it had acquired strength to support itself.

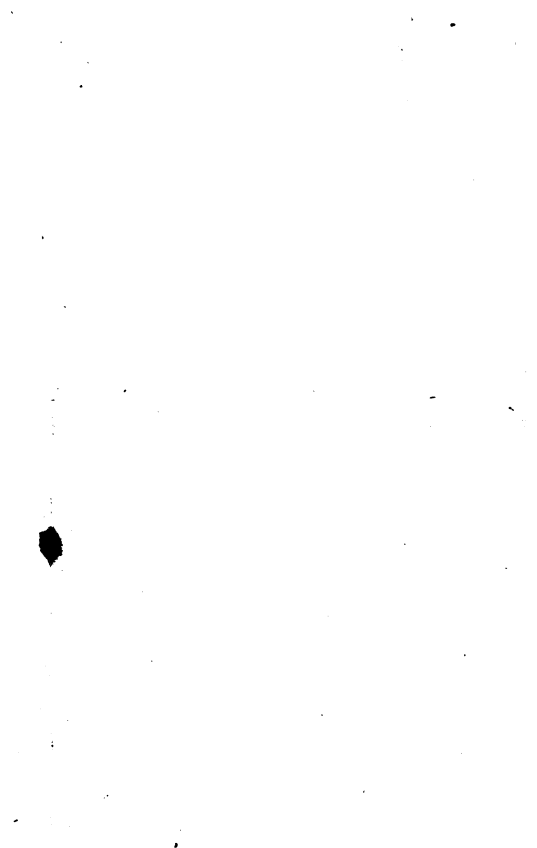
At the time he was placed under my care, I had a cast made from his foot, and when he was removed from my care I had another. The annexed, pl. 15, contains three views of each of those casts, to shew the alteration that was produced in the *form* of the foot, and the following measurements will shew the alteration in its size.

	In the Original Foot.	In the Restored Foot.
	Inches.	Inches.
Length of the foot - -	$7\frac{1}{2}$	9
Circumference at the toes - -	$8\frac{1}{2}$	$7\frac{1}{4}$
Ditto at the instep - -	$11\frac{3}{4}$	$11\frac{1}{2}$
Ditto smallest part of the leg	$7\frac{1}{2}$	$7\frac{1}{2}$
Ditto at the largest part of ditto	$10\frac{1}{4}$	$10\frac{3}{4}$
Length from the patella to the ground - - - -	16	17

The comparison of these models and their measurements, demonstrates that the natural form of the foot was restored in this case, and its length increased by depressing the arch of the foot, and thus lengthening the whole. The most remarkable circumstance in the case, though not the most important is, that the great toe, which appeared to be permanently contracted from the earliest infancy, should be

2.





be reduced into its natural position, and acquire its natural action in the space of eight months, when, in another case, which did not appear to be worse than this, a similar circumstance could never be overcome at all.

In the deformed state of the foot, not only the arch of the foot was higher and shorter than it should be, but the toes were spread to a distance from each other; by remedying this defect it appears, that the circumference at the toes is less in the restored foot than it originally was: the circumference round the heel and instep is likewise something less; and by being kept in action, the muscular part of the leg has been increased in size.

I saw this young gentleman in the summer of 1804, when he had laid aside every kind of bandage, his foot had attained strength enough to support itself in every situation, and its form as perfect as when he left me in December 1802. I am therefore warranted in saying, the cure is now complete and established, without the probability of a relapse.

CASE XXXVI.

Master C. is said to have been born with both his feet as perfect as those of any other child, but when about three years old, acquired, from playfulness, a trick of walking upon his toes, and turning his feet inwards, which he continued to do till they acquired that deformity for which he was placed under my care.

This was the account I received from his parents, who, undoubtedly, told that which themselves believed to be true; but it is more reasonable to believe that there existed, previously, some peculiarity of form, or some defect in the action of the feet, which gave rise to that habit which confirmed the deformity.

When placed under my care, in September 1801, he was between twelve and thirteen years of age; healthy, strong, and well made in every respect, except his feet, which were alike deformed.

I had models taken from both his legs: the annexed, pl. 16, contains four views of the left leg, which shew correctly the state of the deformity.

He was unable to bend the foot more than is there represented, so that when he stood upright, his heels did not touch the ground: those muscles which should turn the foot outwards, were incapable of acting, so that the feet turned continually inwards, the toes striking against each

each other as he walked, and as he was incapable of lifting his feet directly upwards, he necessarily made a circuitous motion with each leg as he walked, like a man with a wooden leg : this gave a peculiar awkwardness to his gait, and actually incapacitated him from taking much exercise.

All the views in the annexed, plate 16, will give a general idea of the deformed state of his feet ; but the back view will explain, particularly, the manner in which the toes turned inwards, and the outer ancle *appeared* to be enlarged ; but this *appearance* is, in fact, a consequence of the peculiar position of the foot. Upon referring to the view of the inside of the leg, it will appear, that the foot is contracted in its whole length, the great toe being drawn inwards, the arch of the foot shortened and lengthened, and the instep, as it is called, being much higher than in a foot of the natural form. In September 1801, he was placed under my care. In about nine months his feet were perfectly reduced to their natural form, and had acquired much of their natural action ; but the loose and weak state of the ligaments which connect the bones of the feet, giving a strong tendency to relapse when the feet were brought into action, it was found necessary to support them artificially, till they had acquired strength to support themselves. In December 1802, he was perfectly cured, and returned into the country, where he has remained well ever since.

The suddenness of his departure prevented me from taking models from his legs in the state they were when cured, as I usually do : but the resemblance of this to the preceding case, which was under my care at the same time, renders the omission of less consequence, as the cure was as complete, and the form of the feet were as perfect as that of the former case.

CASE XXXVII.

Miss W. was born with both her feet distorted, but was not placed under my care till January 1802, when she was almost thirteen years of age.

At this time it was impossible to discover what had been the original state of her feet, for there was much deformity, besides what is usual in this kind of distortion. I was informed by her friends, that application had been made to many persons in hopes of getting her cured, but without success. From some she experienced a degree of

of temporary or apparent relief, but her feet soon relapsed again. From the operation of others she suffered most severely, without deriving any benefit; she had had extensive ulcerations in several parts of her feet from violent pressure, and the bones of her feet were in a state of confusion, such as I had never observed in any case of this disease: it is probable that the persons who had been employed, had no knowledge whatever of the nature of the disease, or the natural situation of the parts that were affected by it: they had imagined, that the feet were mere masses of matter, of a shape different from what feet usually are, and reasoning by the common system of ignorance upon this subject, supposed they had nothing to do but to press and squeeze, and twist them about, till they had brought them into their natural shape, if they were able to do so.

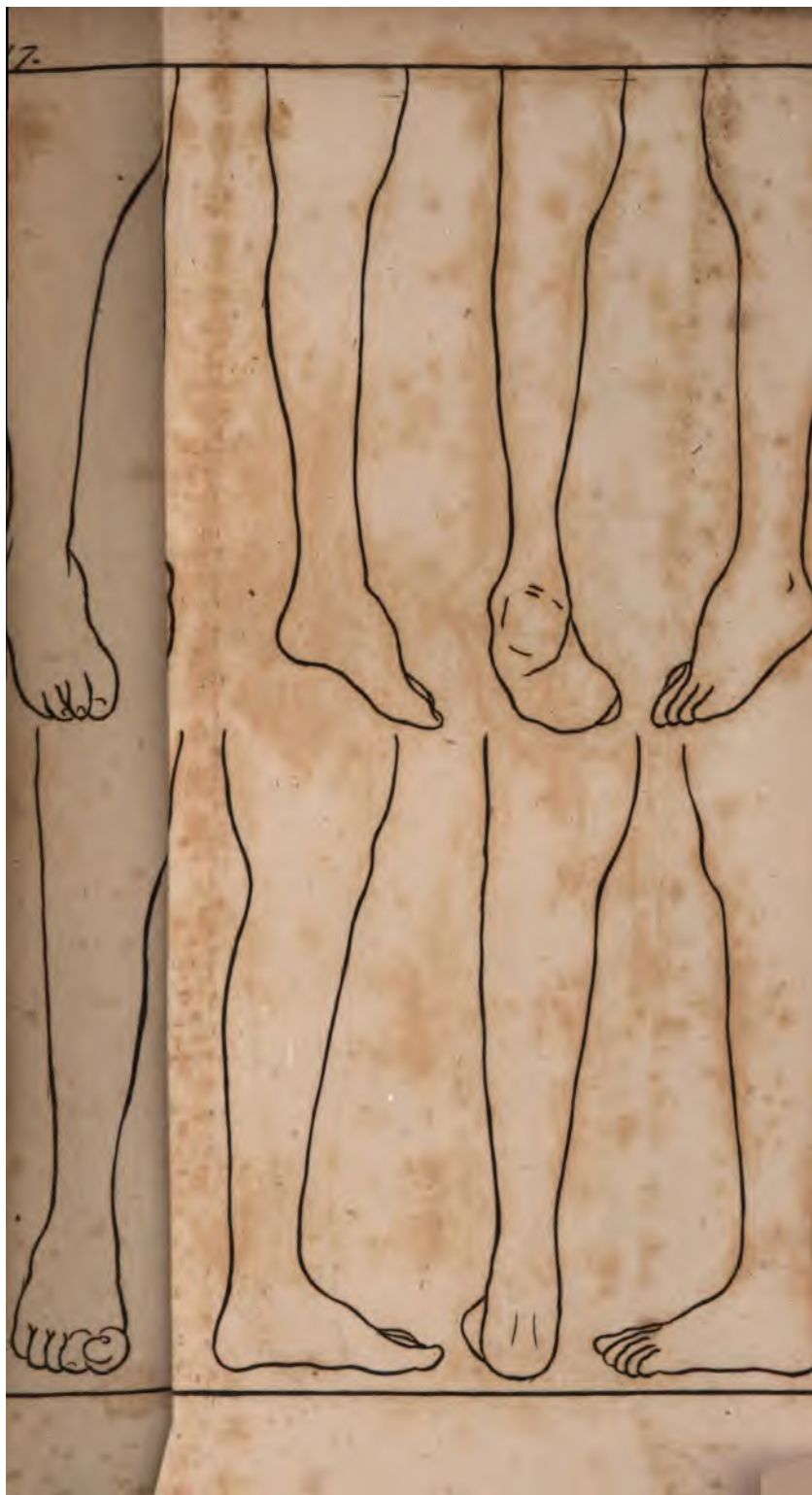
She was scarcely able to walk at all, and, in what little exercise of that kind that she was able to take, she went upon her toes; her feet turned inwards, and were quite incapable of motion at the ankle joint. The left foot was the least deformed, and there was some apparent flexibility at the junction of the metatarsal bones with the tarsus; the fibula was thrown backwards much more than in most cases that I have seen, and that part of it which constitutes the outer ankle had been materially injured and deformed by improper compression. The left foot was much smaller and more deformed than the right, in every particular.

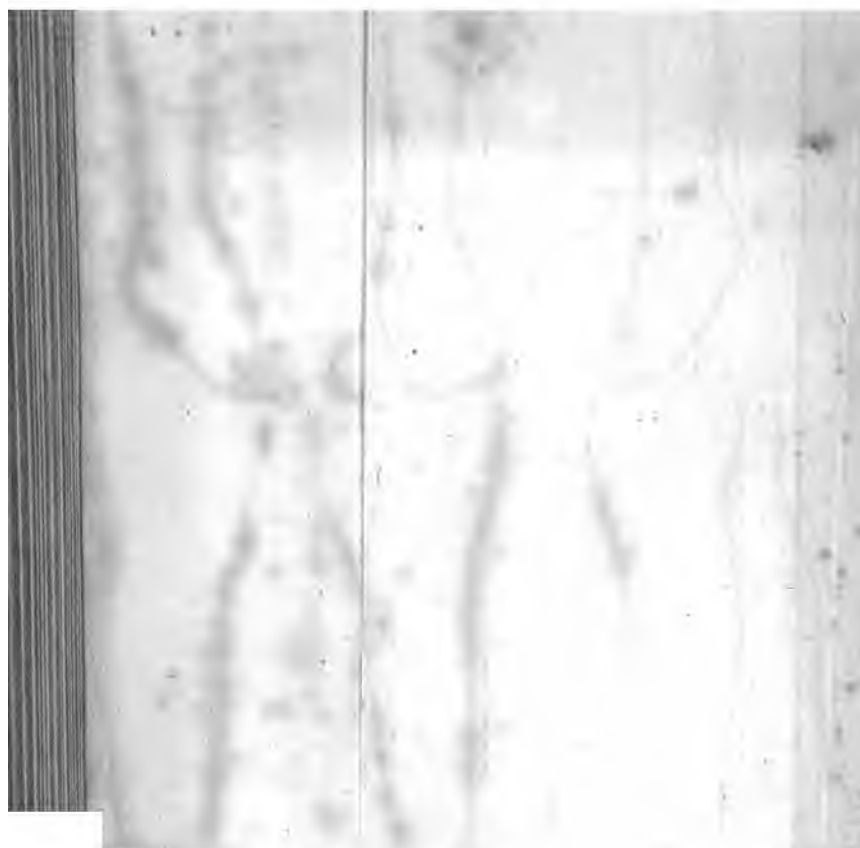
In November 1803, the left foot was so far recovered that it was capable of every natural motion that could be performed by the foot of any other person; but the right was so much more deformed and more rigidly fixed in its deformed state, that it was not till June 1805, that it was equally capable of performing its natural functions: at this time both feet were equally well in that respect, but some weakness remained. She was at this period removed from my care, with such instruments as were necessary to secure the advantages that had been gained.

At the time she was placed under my care I had a model taken from each of the legs, and another from each when she was removed from under my care. In the annexed, pl. 17, I have drawn four views from each of the distorted legs, and four views from each of the restored legs, placed in the same situation. By a comparison of these sketches, an accurate opinion may be formed of the alteration that was produced in this patient's feet. The comparative measurements are as follow:

	In the Deformed Foot. Inches.	In the Restored Foot. Inches.
Of the left foot :		
Length of the foot from the heel to		
the end of the great toe -	6 $\frac{3}{4}$	8 $\frac{3}{4}$
Circumference at the toes -	7 $\frac{1}{2}$	8 $\frac{3}{4}$
Ditto round the heel and instep	10 $\frac{1}{4}$	12 $\frac{1}{4}$
Ditto round the smallest part of		
the leg - - - -	6 $\frac{1}{2}$	8
Ditto round the largest part of		
ditto - - - -	10	12 $\frac{1}{4}$
Length of the leg from the top of		
the tibia to the bottom of the		
heel when standing -	16 $\frac{1}{4}$	17 $\frac{1}{4}$
Of the right foot :		
Length of the foot from the heel to		
the end of the great toe -	6	8
Circumference at the toes -	8	8 $\frac{1}{2}$
Ditto round the heel and instep	10	11 $\frac{1}{2}$
Ditto round the smallest part of		
the leg - - - -	6 $\frac{1}{2}$	8
Ditto round the largest part of		
ditto - - - -	8 $\frac{1}{2}$	11 $\frac{1}{2}$
Length of the leg from the top of		
the tibia to the bottom of the		
heel when standing -	16	17 $\frac{1}{2}$

In reporting this patient to be cured it must be understood, that she was restored from the condition of a helpless cripple to that of a person capable of going through all the necessary exertions of life, as well as any other of her sex and condition, and without any peculiarity of appearance that could be distinguished through her ordinary dress; but it must be remarked, that there were some peculiarities remaining, partly the natural consequences of the disease, and partly the consequence of the improper treatment she received before she was placed under my care. If she had been confided to me at an earlier period, none of those circumstances which were the consequence of improper treatment would have taken place, and those which are generally attendant upon this kind of deformity would have been more effectually remedied, and, consequently, the remains of them would have been less apparent than they now must be.





So far as experience will enable me to form a general opinion on the subject, I should say, I have never seen a child born with this deformity, the *parts* of whose feet were less than they would have been if the feet had had their natural form: many of the feet of the children *appear to be shorter than common*, because those *parts* are improperly combined: but, if that improper combination is rectified at a very early period of life, the feet immediately gain their natural size as well as their natural form. If a child is born with one foot distorted, and that distortion is removed at an early period of life, his feet are of equal length and size: if the defect is not removed before he is three or four years old, the distorted foot, not having grown so fast as that which was distorted, when the deformity is removed, will be half, or perhaps three quarters of an inch shorter than that which was not distorted: from the time the distorted foot is cured, the two feet will grow equally, and the difference between the length of the two feet, when the patient is arrived at manhood, will be no more than it was when he was but three or four years old: this difference is inconsiderable, and by a little management of the shoe may be concealed from observation. This difference would have been less, if the cure had been undertaken, and it would have been greater, if the cure had been longer deferred.

In conformity with this general principle, the right foot of this patient was more deformed, and, at the age of thirteen years, was three-fourths of an inch shorter than the left: an equal alteration was produced, *i. e.* two inches were added to the length of each foot by the alteration of its form during the progress of the cure, and the difference between them was exactly the same as before the cure was begun.

The heel in the right foot was, to use the common way of describing it, much shorter than that of the left, *i. e.* by the greater degree of distortion, the astragalus was thrown more forwards, the os calcis approached nearer to the tibia, and therefore the heel *appeared* to be less than that of the other foot: it was this circumstance which rendered so much more time necessary to cure the right foot than to cure the left; but when the cure was complete, they were nearly equal, the heel of the foot remaining only so much smaller, as was the necessary consequence of the whole foot being smaller than the left.

The difference in the circumference of the legs is to be accounted for upon similar principles: the fleshy part
of

of the leg is composed of those muscles whose office is to move the foot; the feet which are distorted like those of this patient, are almost incapable of voluntary motion, therefore the muscles which should move them, waste and diminish in size for want of action; when the feet are enabled to act, the legs always increase in size; and thus we see the increase of size from this was nearly equal in both this patient's legs.

This patient grew very little in height while she was under my care; the legs were of equal length, yet we see the right leg at first *appeared* to be half an inch shorter than the left; but, in fact, the tibia was of the same length in each; but, by the greater distortion of the right foot, the os calcis was raised more, of course the heel *appeared* to be shorter than in the left; but when both the feet were cured, the legs were undoubtedly of equal length.

It has always appeared to me, that in this disease the bones of the leg are preternaturally straight, and I have reason to think, that this peculiar formation of the leg is the real predisposing cause of the whole distortion. This remark has not been made, so far as I know, by any other person: the present case affords an excellent illustration of the fact. Whoever is competent to form a judgment on the subject, and will examine the front views of the legs in the annexed plate, will perceive, not only that the bones of the leg are straight, but that the outside of the tibia is in a direct line with its outer condyle; so much so, that the leg seems as if it was removed from its position under the knee, leaving the patella over the inside of the leg, and the inner condyle so projecting, as to give the inside of the knee the appearance of being uncommonly large and clumsy. Much of this appearance disappears when the cure is undertaken early in life, but in this case could not be diminished in the smallest degree.

The position of the outer angle, and the peculiar form of the foot in consequence, was the effect of pressure rashly applied by the ignorant people who first engaged in the cure of this case: this could never be diminished, and there is good reason to believe, that the case was rendered worse, and more difficult to cure than if no attempt had been made previous to the patient's coming under my care.

OBSERVATIONS ON THE PRECEDING CASES.

If we take a general view of the disease, as it is exemplified by the preceding cases, it will appear, that it commonly takes place before the birth; some children have one foot distorted, and others both; and this distortion is different in degree, in point of form as well as rigidity; a variation of circumstances that cannot be perfectly accounted for, though it is not impossible that a rational conjecture may be formed on the subject.

Those who should compare any of the feet represented in the preceding plates (particularly the first ten), with the feet of children that are naturally well formed, will not be much surprised to find, that an opinion has generally been entertained that there is some radical malformation in particular bones of the foot, or some deficiency in their number, to occasion a form of the foot so very different from the natural shape of that member: the uninformed generally entertain this opinion, and many professional men have thought so; a circumstance that is not very surprising, when we consider that the disease has never been accurately investigated by professional men; but when it is considered that in all the cases which have been related, the feet were perfectly restored to their natural form and action, and that every case is so restored if the requisite mode of treatment is adequately followed, the falsehood of the prevailing opinion is demonstrated; for if the bones were deficient in number, the defective ones could not be created and inserted in their proper places; if the individual bones were formed in an unnatural shape, it is not very likely that that shape could be so altered as to allow us to reduce the foot completely to its natural form; but when it is shown that the whole foot assumes an unnatural form, because a defective arrangement of the parts which compose it has taken place, it will be granted at once, that if the imperfect arrangement can be corrected, the foot must inevitably be reduced to the natural form; and this is the effect that I have invariably produced.

Having, in some degree, ascertained WHAT the disease is, it may be proper to advert to the probable cause of it, as very erroneous opinions have prevailed on that subject: the women universally attribute it to fright, and in this opinion, for want of a better, they are very generally followed by others; yet, there is perhaps no subject
upon

upon which the effect of fright can be resorted to with so little probability of accounting for the phenomena in a rational manner.

I have seen several hundred cases of this disease, all varying from each other in many particulars, but all bearing evident marks of being the effects of a similar cause; it surely would be too much to say, that all these women, of different ranks, habits, and situations in life, and residing in different countries, should be so frightened as to produce the same effect upon the children they bore; yet this is the real state of the argument that must be used by those who would prove that this deformity is the effect of fright; the ipse dixit of the woman herself is to be considered as nothing at all, even though some persons may say, it is hard that a lady cannot tell if she was frightened or not.

The late Dr. W. Hunter was of opinion, that fright in the mother could not produce those effects on the fetus in utero, which are so boldly attributed to that cause; and in his lectures he used to support his doctrine by saying, that to ascertain this fact, he always made it a rule when he discovered any mark or peculiarity in a child, to conceal it from the mother till he had examined her, to ascertain whether she *recalled* any fright or other accident that could account for the peculiarity in the child, and in no instance could he obtain any satisfactory information as to such cause of the peculiarity; but after the mother had been informed of the circumstance, a strong memory, and stronger imagination, soon produced some accident that positively accounted for the effect, and remained incontrovertible ever afterwards. It is not for me to give a general opinion upon this subject, yet, my experience in this particular disease, certainly coincides with the Doctor's general opinion; for it is common in cases of this kind to conceal the circumstance from the mother, lest her fretting on the subject should injure her health; and, in this situation, I have never found a lady who suspected the state of her child's feet, or remembered that she had been frightened; but when the fact has been known, some story about a beggar woman with a deformed child, or similar accident, has generally made its appearance to account for the fact; and I have seldom seen a child at all advanced in life with this kind of feet, whose mother could not tell exactly how she had been frightened so as to deform her child; and it is very probable, that by

the time the child was brought to me, she had told the story so often that she believed it herself.

Notwithstanding all this, a peculiar circumstance that I have always observed in these cases will account for the origin of the disease upon very natural principles. Every one that is at all employed about children knows, that immediately after their birth their legs are more bent than they are sometime afterwards, and their toes are disposed to turn inwards; a peculiarity that does not cease till they begin to walk: every professional man knows that this peculiarity is occasioned by the position of the fœtus in utero; the legs are drawn up, and the feet fold over each other, that they may lie within the ova-like the form of the uterus; and therefore the leg and foot, from the knee downwards, assume the form of a section of the uterus within which they lie, and so much of the curve as is more than the most advantageous form of the parts, disappears gradually after the child is born. But in all the cases of *varus*, or club-foot, that I have seen, the bones of the leg are *preternaturally straight*; the consequence of which form is, that as the leg and foot together must be so curved as to come within the form of the uterus, and as the leg is (from a cause which perhaps cannot be ascertained) quite straight, all that curve which should be divided equally in the whole length of the leg and foot, is confined to the *foot alone*, the many bones of which it is composed easily forming acute angles with respect to each other, and thus the whole foot assumes an unnatural shape, as well as taking an unnatural position with respect to the leg, the degree of deformity and of rigidity being, in all probability, proportioned to the earliness of the period at which the peculiarity begins to take place.

This disease appears to be distortion of the feet, occasioned by undue compression of the fœtus in utero, and this compression is the necessary consequence of a peculiar form of the leg. The distortion is a derangement in the relative situation of the bones of the foot, and not an unnatural form of any one or more bones; therefore the form of the bones does not oppose any impediment to the cure of the distortion, which, so far as *they* are concerned, consists in arranging them in their natural situation with respect to each other; this has not generally been understood to be the state of the disease: an opinion has very generally been entertained, that there is a distortion of particular bones of the foot; and when I first demonstrated that these distortions might certainly be cured in children

of two years old, it was reluctantly admitted, *because the bones were soft, and susceptible of alteration by compression*; but there is now evidence that, in patients who have laboured under this distortion from the birth to the age of fourteen years, a radical cure has been effected, *i. e.* their feet have been reduced to their natural form, and rendered capable of performing their natural functions; and, in no case that has come under my care, even those of the most advanced periods of life, has the form of the bones of the foot opposed any obstacle to the cure.

The bones have always been passive; when compressed out of their natural situation by external circumstances, they have remained in the situation they have been placed in, being retained in that situation by the ligaments which connect them together. Whoever understands the anatomy of the foot and leg, and will cast their eyes over any of the figures of distorted feet in the preceding plates, will see at once, that if all the bones have their natural form, the ligaments which connect them together must be in a state distant from the natural state, in exact proportion to the degree of deformity in the foot; and it is to the state of the ligaments in different cases, that we are to look for the real obstacles that are to be overcome in effecting the cure. In two patients whose feet are equally deformed, the one shall be most rigidly fixed in its position, while the other shall be so flexible, that it may almost be placed and held in its natural position with very little effort, because the first has been so long in the unnatural position, that the ligaments have grown into a form that connects the bones firmly together in the deformed position; but the latter has been in its improper posture but a short time, and therefore the ligaments remain loose, and admit the foot to be turned and placed in any direction.

In curing a distortion that is rigidly fixed, the first operation is to produce so much extension of the ligaments as shall admit the foot to be placed perfectly in its natural form; the second is to retain it in that form, by artificial means, till the ligaments have grown so perfectly as to support the foot in that form without danger of a relapse. It is an axiom generally established in the animal economy, that all young animals grow most in a given space of time, immediately after the birth, their growth becoming less rapid in proportion as they advance in life; and of all parts of the human body, ligaments are least prone to undergo a permanent alteration. From these facts are to be deduced

deduced the strongest arguments for the propriety of effecting the cure of these distortions as soon as possible after the birth: extension of the ligaments may always be produced, but, even when skilfully effected, it is by an alteration very like the effects of luxation; there is debility in the ligaments, and looseness in the combination of the bones of the foot, consequent to the redundancy in quantity and looseness of texture in the ligaments which connect them; and as ligaments undergo any alteration but slowly, there can be no doubt, that by deferring the cure, a much longer time must be consumed in effecting it than if it was undertaken at the earliest period, when the ligaments are most susceptible of permanent alteration.

No obstacle is opposed by the muscles to a cure of this species of distortion in the early periods of infancy: it is true, that the action of the muscles is deranged, but it is likewise defective, and naturally imperfect in all children, before the period at which they usually begin to walk: if then the cure is undertaken before that period, and skilfully conducted, the child will be brought upon his legs in the natural way, without having lost time in the cure, or acquired any improper mode of action from the imperfect state of his legs, but, in proportion as the cure is deferred, the obstacles from the causes that have been mentioned will be increased, as well as the time and trouble that must be employed to overcome them.

In the cure of this deformity, when skilfully conducted, no danger to the patient is to be apprehended; but as professional men have not made it an object of attention, it has generally been abandoned to the most contemptible empirics. Among the *learned doctors* who have acquired a sort of reputation upon this subject during the last twenty years, are to be remembered a shoemaker, a blacksmith, and a hedger and ditcher. The bones of infants are, indeed, so near the state of cartilages, that they may easily be altered, or distorted, by compression; and as the persons alluded to had no knowledge of the structure or nature of the parts concerned in the disease, and *no notion* on the subject, but, that while young and soft, the bones of children might be pressed and squeezed, and turned into any shape they pleased, it is not surprising that such persons should do mischief in attempting to cure these distortions, without having a particle of knowledge on the subject. It is certain, that in the case represented in pl.

17, much mischief was done by the ignorance and rashness of the persons who were employed.

The simplest state of the disease exists in children from the birth to the period at which they begin to walk; in this state there are many degrees; from the highest degree of distortion, which will admit the foot to be placed in the natural position with the slightest effort, to the greatest deformity, which is confixed with the most absolute rigidity in its deformed state, they require treatment proportioned to their peculiar situations; but they all agree in this, that they are, simply, the consequences of compression of the foetus in utero: but after the patients begin to walk, the disease becomes more complex from several circumstances, and continues to become more tedious and difficult of cure from those circumstances, in proportion as the patient advances farther in life.

If the distortion was originally so great that the tarsus made an acute angle with the bones of the leg, so that the patient would have stood upon the side of his foot if he had been capable of standing at all, no alteration is produced in the general form or position of the foot, by permitting the child to walk; but if the distortion was, originally, in any smaller degree, it is directly though gradually increased, till the side of the foot comes to the ground; because, in any lesser degree of deformity, the side of the foot forms an oblique angle with the leg, and is not able to support the weight of the body, till the side of the foot comes directly to the ground; so that, however slight the distortion may originally have been, they all come into the same situation in this particular, after they have walked upon their feet for a few years. Examples of this are to be seen in plates 2, 7, and 9; the position of the metatarsal bones, with respect to each other and to the tarsus, varies in different patients; but in all patients who labour under this deformity, it will be perceived, that when arrived at maturity, their feet assume the same position and form in this particular.

Another circumstance worthy of observation is, that previous to the period when children begin to walk, the fleshy parts of the legs do not, in these cases diminish; that is, a child whose leg or legs resemble pl. 1 at the time of the birth, will preserve the same appearance, if he continues healthy, till he begins to walk, his feet will then become more deformed, and his legs gradually decrease in size, till, about the age of eight or nine years,

his

his feet will become rigidly fixed in their deformed state, and incapable of any voluntary motion; his legs will be wasted, and the muscles so much diminished, as to leave little but the bones covered with skin; and if a patient has only one leg distorted in this manner, *that* leg will waste while the other grows with the body, and acquires its full proportion, thus making the defect more evident.

To account for this invariable alteration, it must be observed, that if attention is paid to children who have this distortion, even at the earliest period of life, they have but little power to use the extensor muscles of the leg or foot. In all their imperfect struggles for motion, the toes are drawn more downwards, and the feet more inwards and upwards, while there is no corresponding power exerted to draw them back again; so that whatever may be the degree of deformity at the time of the birth, it will be materially increased, and become more rigid during the first ten months of the child's existence; and as there is no restraint upon that degree of motion of which the parts are capable, they do not waste away; but when the patient begins to walk, his foot takes some firm position upon the ground, which becomes permanent, the flexor muscles are used constantly without any counter-acting power; their action is always contractile, till it is entirely lost; a deficient circulation and loss of substance is the consequence, till the whole is wasted to little more than the bones: there are very few who arrive at maturity with feet of this description, who have any voluntary motion in their feet; they are supported by them, but for all the purposes of loco-motion they are as useless as wooden legs; the movement of the body being entirely effected by the muscles of the leg. It is for this reason that such persons labour so much in walking, and are so much fatigued by a little exercise of that kind.

These defects increase as the patients advance in life, and render the cure more difficult in proportion to the age of the patient. But as I have cured several at the age of fourteen years and upwards, and in pl. 31 is represented a case in which there was as much distortion of the bones of the foot as can exist in a very bad case of *varus*, and the patient was twenty-five years of age, the following conclusions may be drawn from the whole of my practice, viz.

1st. That all these cases, if undertaken before the period that children usually walk, may be completely cured, so that the patients will have the full and perfect

use of their feet, and grow up to maturity without any peculiarity of form or action that can distinguish them from others, whose feet have never been distorted ; and

2dly. That all the cases I have seen in patients between the age of two years and fifteen or sixteen years, have been cured, so far as to restore the form and perfect use of their feet ; but in these cases peculiarities will sometimes remain, according to the period of life at which the cure is begun, and the particular circumstances of the case.

It has been remarked, that this distortion is usually attended by a peculiar form of the leg, viz. an uncommon straightness of the tibia and fibula ; to which is frequently added, uncommon prominence of the inside of the knee ; this is occasioned by a peculiar form of the tibia ; it appears that, instead of the body of that bone being under both condyles, it is entirely under the outer one, therefore the leg and thigh appear to be straight when viewed on the outside, but the knee is unusually large on the inner side. This peculiarity of form is very evident in the first fig. pl. 17. When the cure is undertaken in early infancy, this peculiarity either disappears entirely, or is so much diminished, that it is not remarkable as the patient grows up ; but if the cure is delayed to a later age, this peculiarity increases with the growth of the child, cannot easily be altered, and in the case that is represented in pl. 17, could not be diminished at all.

Another peculiarity has been remarked in some cases, viz. that the fibula is forced unusually backwards, so as to be in a line with the tendo Achilles ; this *may* be occasioned by a peculiar position of the astragalus, which would then force the fibula backwards : this was probably the cause of the peculiarity in some cases in early infancy, in which I was able to remove it ; but I have more frequently observed it in patients from the age of three years and upwards, in the early part of whose lives very injudicious attempts had been made by the pressure of leg irons to cure the defect. In these it has always been irremediable ; it gives a degree of ugliness to the form of the leg, as may be remarked in pl. 9, and pl. 10, besides, it leaves the ankle joint weak ; most of the strength of that joint depends upon the support of the astragalus, by the fibula being placed directly on its outside ; but where the fibula is placed in the situation that has been described, it lays *behind* the astragalus, and therefore does not support it at all.

Another peculiarity is the decrease in the size of the legs,

legs, in proportion as the patient is advanced in life before the cure is undertaken; where both legs are affected, this is not of so much consequence, as both the legs are alike; but when only one leg is affected, it may be thought a serious inconvenience; for a man to have one leg much smaller than the other, even when it has no other defect; and this defect always increases in proportion to the age of the patient, before the cure is undertaken. Those patients who have only one leg affected, afford the most incontrovertible proof, to determine this fact. In the whole course of my experience I have observed, that in very young children who have only one foot distorted, there has been no difference in the size of the legs; and after they have been cured, there has seldom been any difference in the length of the feet. In one case, the foot which had been distorted, and was cured before the patient was eighteen months old, the restored foot measured three-eighths of an inch less in length than its fellow; in patients from eight to fourteen years old, I have found the difference between the two feet amount to one, and in some cases to two inches. This difference, when once it has taken place, can never be diminished; it takes place, because the distorted foot and leg does not grow so fast as the others, and this inequality of growth increases with the age of the patient; when the foot is cured, the inequality does not increase, but the legs and feet grow equally fast, the same difference in their size always remaining, that existed at the moment the patient was cured: if then a patient is cured at the age of eighteen months, and his foot remains three-eighths of an inch shorter than the other, there will be the same difference in the length of his feet when he is arrived at manhood, and this difference will not be perceptible; but if the same child should be suffered to remain in a state of deformity till he is eight years old, and his foot, when restored, was one inch or an inch and a half shorter than his other foot, there will be the same difference between his two feet when he arrives at maturity, and this difference will be extremely visible.

The same facts exist, and the same reasoning applies to the difference in size of the legs; in the earliest periods of infancy, the legs are equal in size; as the patients grow, the muscles of the distorted limb waste for want of action, and in proportion as the patient advances in life; when the distortion is cured, the muscles are forced into action, and consequently, increase in size; but in general, the muscles of the restored leg will remain as much smaller,

in proportion to the other leg, as they were at the time the cure was first effected.

Another very essential inconvenience that arises from undertaking the cure at a late period of life, is the additional time that must be consumed in effecting the cure; a case, that at the age of six months might be cured in three or four months, will require as many years to effect it, if the patient is eight or nine years old before the cure is undertaken; and if the most unremitting attention is not paid during the whole time, the cure will be procrastinated, and if, from any cause, the regular mode of treatment is given up too soon, a relapse must be the consequence, and all the business will be to do over again. Upon the whole, though it must afford much consolation to the afflicted to know that they may be cured of this deformity at very advanced periods of life, the advantages of effecting the cure early are so great, that it cannot be too earnestly recommended to every one to choose the earliest period of a child's existence, to remove the distortion in the most effectual manner.

CASES OF VALGUS.

CASE XXXVIII.

Master L. was born with his right foot turned outwards and upwards, in that direction which constitutes the distortion which is commonly called Valgus. There was no defect in the form of his foot, it merely seemed that he lifted his foot considerably more upwards when he moved than it is usual for children to do: his parents were alarmed at the appearance, and consulted me: some days elapsed before it was determined what should be done, and, in the mean time, the defect seemed to decrease. Under these circumstances, it was determined to wait some time before any thing was done; the defect gradually diminished, and, in three months, entirely disappeared, without any thing having been done to assist it. I have seen him many times since, and there is no peculiarity in the form of his foot, nor is there the least weakness or imperfection perceptible.

CASE

C A S E XXXIX.

Master W. was born with one of his feet in a similar situation with the former ; the event of that case was fresh in my mind, and, I thought, justified me in advising that nothing should be done till we had waited to see what the efforts of nature would effect : in less than two months every peculiarity of appearance had disappeared, and the child, now more than eight years old, has never felt the least inconvenience from the circumstance.

C A S E XL.

Master T. was born with his left foot distorted, so as to resemble the first plate in the Essay on Distortions, &c. For this he was placed under my care when but a few days old : some weeks afterwards, his father requested me to examine his right foot, which, till that time, had excited no attention ; there was little peculiarity of form, and in moving the foot he lifted it more upwards and outwards than the natural action required. Judging from the event of the two former cases, I thought it proper to watch the progress of this, as the patient was, on account of his other foot, under my immediate care.

Contrary to what had happened in those cases, I perceived, that as he acquired strength, and struggled to move his feet, his foot was drawn more and more upwards and outwards, so as to throw the head of the astragalus from its proper situation, till it lay behind the tibia, and thus giving the appearance of an uncommon length to the heel, at the same time the foot turned outwards, bringing the inner angle towards the ground, so that he would have stood upon the inner angle, if he had been of age to stand at all. Under these circumstances, I thought it right to confine the foot, to prevent the increase of the defect, and enable it to support itself, till he was able to walk. This was effected, and the varus in the left leg was so far cured, that his parents, who lived at some distance from London, wished to take him into their own hands. They did so ; after a trial of several months, they found that they could not succeed ; the distortion of both his feet relapsed, and it was necessary to place him again under my care. Again his feet were cured, so far as only to require the assistance of simple instruments to support them, till they had acquired strength to support themselves. I was not permitted to take models of this child's feet ; the left foot was not particularly

ticularly distinguished from many, the accounts of which have been given in the preceding pages; and the facts respecting the right foot have been briefly related, as the theory of the disease will be explained more particularly with reference to other cases, the accounts of which will follow this in succession.

CASE XLI.

Miss B. had been born with her left foot distorted, so as to resemble that which is represented in pl. 1, of this Appendix. For this she had been placed under my care at a very early period, had been perfectly cured before she was six months old, and it had never shewn the least tendency to relapse.

When she was about twelve months old, and beginning to go alone, I was requested to examine her right foot, which, as it was said, did not appear to be strong enough to support the weight of her body; the leg was nearly straight, the foot turned outwards, the inner ankle came nearly upon the ground, and the heel appeared longer than usual. There could be no doubt of the necessity of supporting this foot as near the natural state as possible, till it acquired strength to support itself: but other opinions prevailed; the parents were told it was only a little weakness, which would go off of itself as the child grew up, and they determined to wait that event; but after a lapse of four months, finding the foot becoming perfectly useless, as well as more deformed, they determined that I should take proper measures to remedy the defect. As there was little curvature of the bones of the leg, the defect was almost confined to the ankle joint, but had become so great, that it was almost three years before the child had acquired sufficient strength to support itself without assistance.

Of the two first cases it was not necessary to take any models, and I was not permitted to take any models of the two latter, I can therefore only observe, that there was little deficiency in the *legs*, the defect was principally confined to the ankle joint, in consequence of the feet having been turned outwards and upwards, previous to the birth, and nearly resembling the foot which is represented in the plate annexed to the following case,

11. The first of these is the fact that the
the first of these is the fact that the

the first of these is the fact that the

the first of these is the fact that the

the first of these is the fact that the

P.18.



CASE XLII.

In June 1800, Miss U. was placed under my care; she was then four months old; the bones of the leg were bent directly forwards, the foot was flatter than is usual with children who are naturally formed, and when the child moved itself, always turned upwards and outwards, towards the outside of the leg, instead of inwards and downwards, which is the usual consequence of the exertion made by children who endeavour to move their feet before they are able to stand; the heel appeared to be preternaturally long, and, upon examination, the astragalus could be plainly felt *behind* the tibia; to which circumstance the apparent length of the heel may be attributed. I took a model of the leg at this time, and in the annexed, pl. 18, have drawn four views from that model, by inspecting which the form of the leg may be perfectly understood. The circumstances which have been described were noticed at the time the child was born; but it was supposed they would disappear as she grew up, and therefore nothing was done to obviate them; but as it was evident they continually increased, instead of diminishing, it was now thought right to adopt the most effectual measures to remove them, and by the following month of February, this was so far effected, that any farther attention was thought unnecessary, and my instruments were removed.

As I had reason to think that this case was not so permanently cured as was imagined by those whose opinion ever overbalanced mine, I declined modelling the leg in its improved state, till it was known whether the cure was permanent, or whether there was any tendency to relapse. Unfortunately, some months after this, through the carelessness of a servant, this leg was fractured, and in consequence of some peculiarity in the child's constitution, of which I have no knowledge, the fractured bones did not re-unite. Many months afterwards I learnt that the fracture continued in the same state, and the case afterwards was removed out of my knowledge, so that I could not learn how it terminated. But, at all events, the fracture must have altered the state of the leg so much, that no conclusion could have been drawn from it as a case of simple distortion.

CASE XLIII.

Miss B. was born with both her feet exactly like the preceding

preceding. In June 1801, she was put under my care, being at that time three months old. I was not permitted to model her legs, a circumstance of no consequence, because they so exactly resemble the model of the former case in every particular, both of size and derangement; that it answered every purpose that could have been proposed by taking models from this patient.

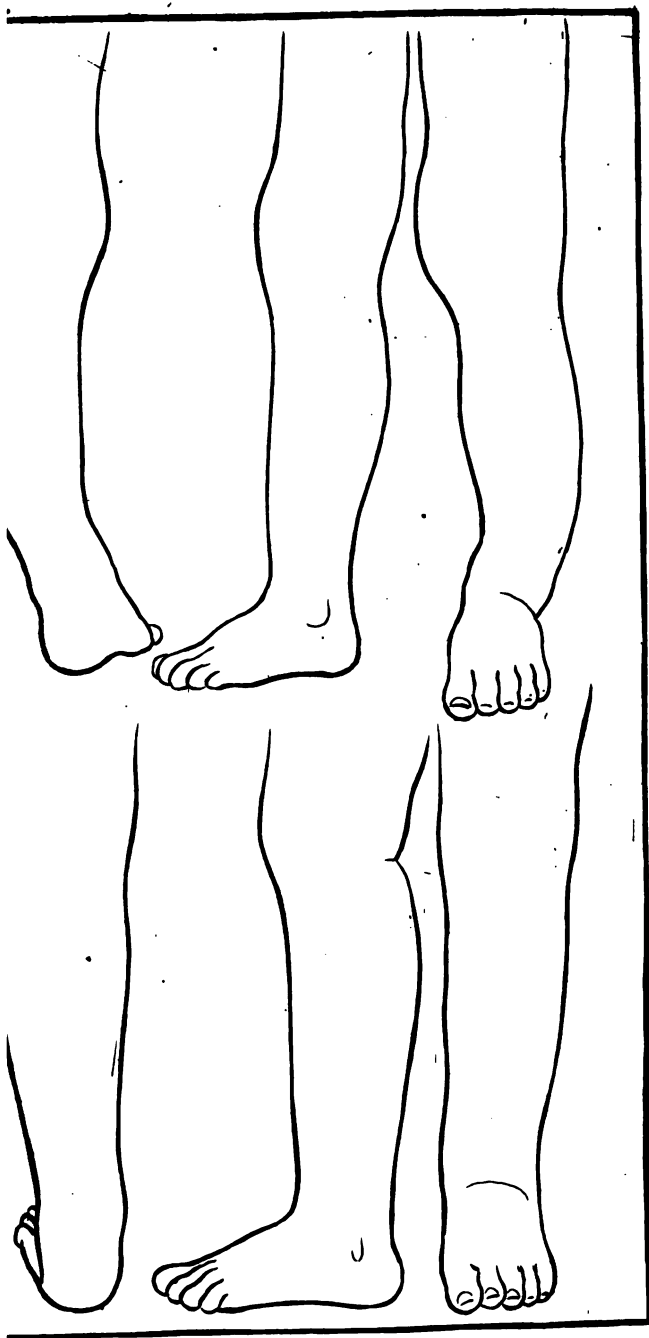
Miss B. continued under my care till the end of October, in the same year, when she was so perfectly recovered, that any further attention was unnecessary. I had an opportunity of seeing her in the spring of 1805, when her legs appeared completely formed, and there was no circumstance remaining to shew that they had ever been distorted.

CASE XLIV.

Master L. was placed under my care in February 1805; he was then two years and a half old; the bones of both his legs were curved directly outwards; his parents thought the distortion was apparent at the time of his birth; their opinion was over-ruled; and their apprehensions quieted by the gentleman who attended; but, as it was evident his legs were daily becoming more distorted, they determined to adopt the most effectual measures to remove the defect. I had both his legs modelled, and the annexed pl. 19 contains three views of his left leg, which was most distorted; the curvature of the bones of the leg is very apparent; the peculiar state of the foot is not quite so evident, though it may be distinguished by those who are accustomed to see these cases.

By the end of June his legs were perfectly restored to their natural shape, and he was removed from my care. Three months afterwards I was informed, by his father, that he continued perfectly well, and shewed no tendency to relapse.

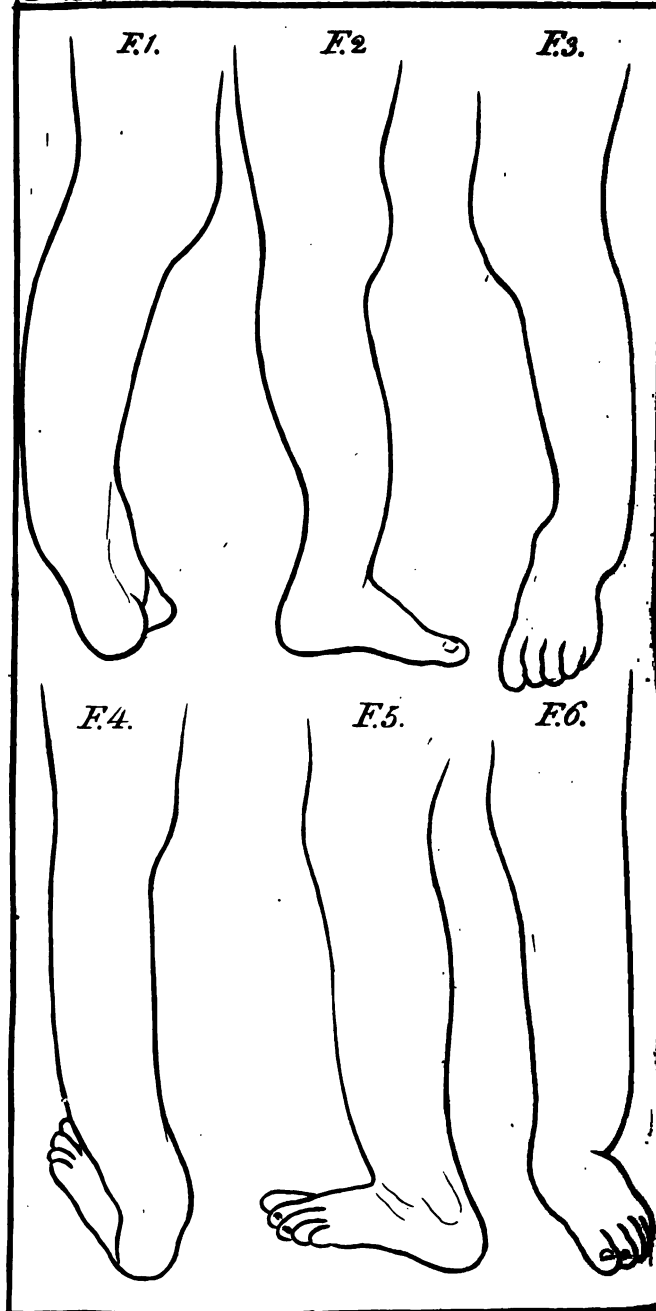
In the annexed pl. 19, I have drawn four views of his leg, from the model that was taken at the time he was removed from my care. By comparing them with the views of the distorted leg it will be perfectly understood, how much the shape of the legs was improved, and it is worthy of observation, that when both the models are placed together, the improved one measures from the patella to the ground almost one inch more than the other. This addition of length cannot be attributed to the growth of the child, but merely to the circumstance, that as the
curve







Pl. 90.



curve of the leg was diminished, its length was proportionably increased; and when a line was drawn perpendicularly from the inside of the knee to the ground, that part of the leg which was most curved, deviated one inch and a quarter from the perpendicular line; but when the leg was restored to its shape, and the same perpendicular drawn, the greatest deviation from it was but one quarter of an inch.

CASE XLV.

March 11, 1801, Miss C. was placed under my care; she was then aged two years and three months; she was delicate in appearance, and it was represented that she had suffered materially in her health, from the gross mismanagement and neglect of a nurse, to whom she was entrusted by her parents, who themselves omitted to see that the nurse did her duty. There was a general enlargement of the bones of the ancles, knees, and wrists; the bones of the leg were bent directly outwards, projecting over the feet, and laterally over the outer ancle; the first curve was so considerable, that when a straight line was drawn from the calf of the leg to the heel, the upper part of the tendo Achilles was seven-eighths of an inch removed from the perpendicular; and when a similar line was drawn from the knee to the inside of the foot on the same side, the deviation of the inside of the leg from the perpendicular line was one inch and a quarter, when the curve was greatest; these measures were taken upon the left leg, the right being not quite so much deformed; the heels too were enlarged, and she had but little power to move her feet, by the action of the gastrocnemii muscles; the double curve in the bones of the leg, and the greatness of the distortion, rendered the cure of this case extremely tedious, but it went regularly on till in February 1802, when the legs were nearly well. At this period she caught the measles, and unfortunately died.

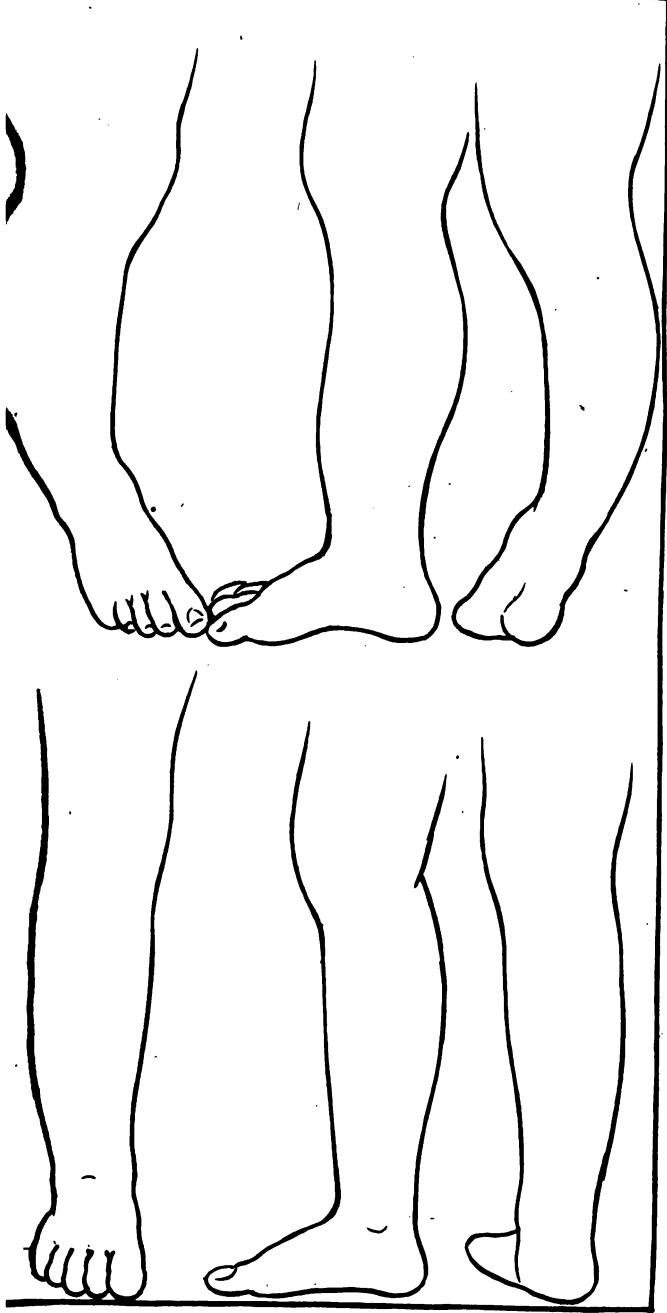
As the cure was not complete, and as I did not know of her death till after she was interred, I had no opportunity of examining the state of her legs, or taking any model from them, which I should most certainly have done, if I had been apprized of the circumstance: but fig. 1, 2, and 3, in the annexed pl. 20, are correctly drawn from that model of her left leg, which was taken at the time she came under my care, and will give a complete idea of the nature and extent of the disease.

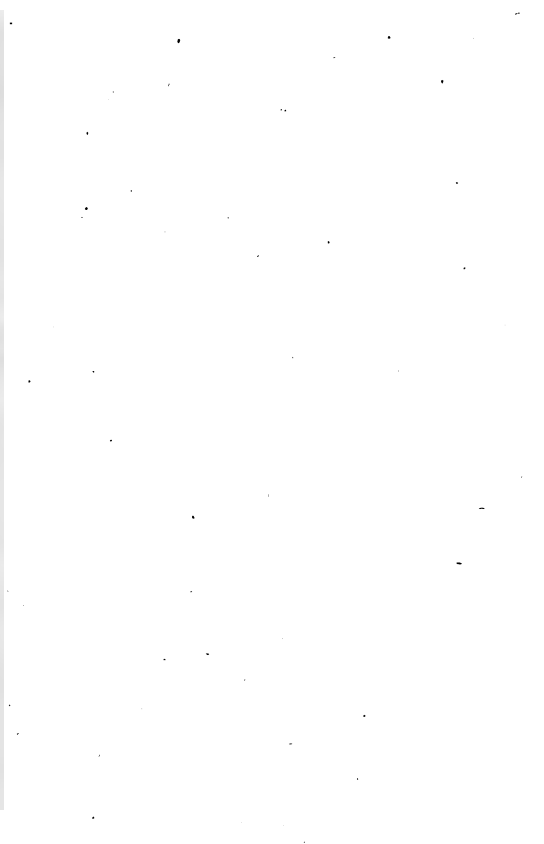
CASE

C A S E X V L I.

In June 1801, Master S. was placed under my care, he was then two years and six months old, and he seemed to labour under every kind of ill health, that can be induced by the consequences of neglect, acting upon a constitution that had not been naturally strong; these circumstances are accounted for by the father being a working tradesman, who lived in a very close part of the town. He had three children, and having unfortunately lost his wife, when this, the youngest, was but three months old, he had, in consequence, been obliged to rear his children with the assistance of such servants as he could employ: from persons so situated I could not obtain a very correct account of this child, of the original state of his feet, or the progress of the distortion; but it was said, that no defect was perceived till after he had walked for some time, when his ancles began to give way, as it was termed, his feet turning outwards, and this defect continued to increase till I saw him; the heels were elongated, and the astragalus was plainly to be felt *behind* the tibia on each leg; the feet were long, in proportion to the size of the child, very flat, and turned outwards, so that the inner ancles approached very near to the ground; there was some curvature in the bones of the leg, of that kind which usually accompanies valgus, that take place before the birth; a circumstance which, though I could not ascertain from information, I am convinced took place in this child, though its effects were not noticed till he began to walk. This disease was extreme weakness in the ankle joint; from this pre-disposing cause, and from debility, in consequence of the relaxed state of capsular ligaments, as well as the debilitated state of the constitution. In the following December these defects were so far remedied, that the feet were perfectly reduced to their natural position, and only required a simple instrument to keep them in their place: this, it was supposed, his own attendants were able to do for him, and he was taken from under my care. As he was not quite well at this time, and I intended to see him occasionally till he was, I deferred taking a model of his feet till he was, by his friends, removed out of my knowledge, and I saw him no more. Fig. 4, 5, and 6, in the annexed pl. 20, correctly represent the state of his feet at the time he was placed under my care.

Fig.





CASE XLVII.

In September 1804, Miss G. was placed under my care; she was then two years and a half old; a considerable degree of rachitis was evident in the whole of her appearance, and from the enlargement of her wrists, ancles, and knees, as well as the curvature of the bones of her legs, which I was employed to cure.

In this case there was a double curve in the bones of each leg, viz. laterally, and directly forwards; the former curved the legs one inch more than they naturally should have been, and the latter three-eighths of an inch, measuring from a perpendicular line drawn from the knee to the inside of the foot in the former view, and from the calf of the leg to the heel in the other, as is represented by the dotted lines in the annexed plate.

As a curvature of this kind can only be corrected by acting upon it in one direction at one time, the double curve in each leg rendered the cure much more tedious than it would have been if it had only been distorted in one direction; but in September 1805, the legs had so nearly required their natural form, that she was removed from under my care. I had models taken from her legs at this period, as I had had at the time she was first placed under my care; the annexed pl. 21, contains three views of the right leg; those at the top of the plate represent the original state of the leg, the lower ones the state it was in when removed from my care.

CASE XLVIII.

In September 1800, Miss B. was placed under my care; she was then eight years old; there was a slight curve directly forwards in the bones of her left leg, but there was no expectation of curing this; she was brought to me in consequence of an injury she had sustained in the ancle; she had no power to move her foot in any direction. When she lifted her leg, her foot hung from it, but she could not direct it in any manner; when she set it down, her inner ancle came near to the ground, the foot turning outwards, but it was otherwise well formed. Upon examination, the extremity of the fibula which forms the outer ancle could not be felt, and the foot altogether appeared as if the fibula had been fractured at that part, and the joint luxated by turning the foot outwards.

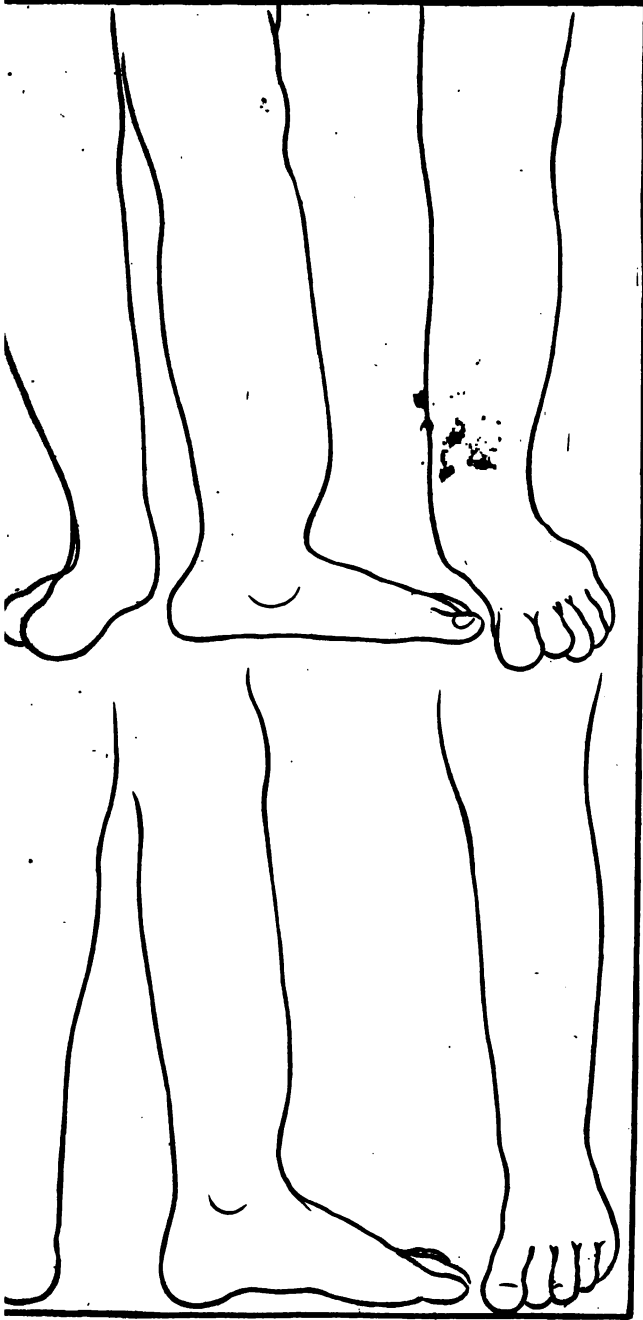
The parents of this child lived at a considerable distance

tance from London; they said, that her feet were both perfect from her birth till about two years before I saw her; they put their daughter to school at a village in their neighbourhood; upon her return home for the holidays, they perceived that she was a little lame, which had been gradually increasing upon her, till she had got into the state I then saw her. The child steadily denied having met with any strain, or other accident, that could lead to discover the cause of her lameness.

The want of the extremity of the fibula to complete the ankle joint, rendered it extremely doubtful if the *use* of the foot could be restored; but as she was getting rapidly worse, it was an important object to attempt every thing that could secure her from further injury.

The foot was gradually placed upright, and supported so as to hinder it from sinking under the weight of the body; it was then moved forwards, so as to bring the astragalus under the scaphoid cavity of the tibia, so that the whole weight of the body bore upon the foot, and in this state it was firmly supported by proper instruments, so as to enable her to walk without straining the parts. In this way it was supported till November 1801, when the foot had regained its natural form and position, and she was able to move it in any manner, but it had not strength enough to support the weight of the body, and upon this account it has been found necessary to apply an instrument to enable her to walk with safety, and which she still continues to use.

In the annexed pl. 22, I have drawn three views of the leg, from the model that was taken at the time that patient was placed under my care; the front and back views, but more particularly the latter, will shew the nature of the injury, and the position the foot had taken in consequence; and those who are acquainted with the structure of the ankle joint will perceive, there is every appearance as if there had been violent luxation of the joint, with fractures of the fibula; the side view will shew, principally, the curved appearance of the bones of the leg; this curvature, it was expected, could not be altered in a child of this patient's age; and, in fact, no alteration was attempted, nor did any alteration take place, though upon looking at the corresponding view of the restored leg, that curvation *appears to be less*, and the ligaments less deformed: the real fact is, that the alteration of the position and form of the whole foot, gives a different appearance





pearance to the whole limb, and makes the curvature of the bones of the leg much less apparent.

The alteration that was really produced in this case was in the position of the foot, and in restoring the power of the muscles by which it is moved; this was completely effected *so far as relates to them*; had the bones of the joint been perfect, there is every reason to believe the cure would, in every sense, have been *complete*; but it is certain, that something had taken place *there* which is irremediable, and must, of course, leave the joint so weak as to require artificial support for a very considerable time. This is one of those cases, all the circumstances of which can never be truly known, but much must be left to conjecture: if the parent's account is true, the child's leg and foot was perfect in its form and action till she was six years old, and then fell into the state in which I first saw it; if this was so, some violence must be resorted to to account for the derangement which then took place; but the child steadily denies that any thing of this kind did happen, and she is certainly old enough to be able to tell if it had, and no apparent motive can be assigned to induce her to deny it. If a conjecture may be indulged, I would suppose, that this was originally a slight case of valgus, the peculiarities of which were not noticed, and actually produced no inconvenience, till the discipline of the school strained the ligaments of the joint, which was unable to bear the stress that was imprudently laid upon it, and thus all the mischief that followed was produced.

This conjecture is strengthened by the appearance of the foot, which had all the peculiarities of form that characterises valgus, even when slight, and which are evident in pl. 18 of this work, which was taken from a subject that had never been set upon its feet, and was but a few months old. The same flatness of this foot, and elongation of the heel from projection of the astragalus backwards, and the same peculiar curvature of the bones of the leg, which is occasioned by the foot being pressed against those bones while confined in the unnatural position in utero.

This conjecture gains strength too from my having seen, within the last twelve months, nine patients, who all had feet in a similar situation, though not in the same degree: all of them were girls of different ages, from five years to sixteen, and I was able to ascertain, that in every case the defect was produced by a peculiar practice of the



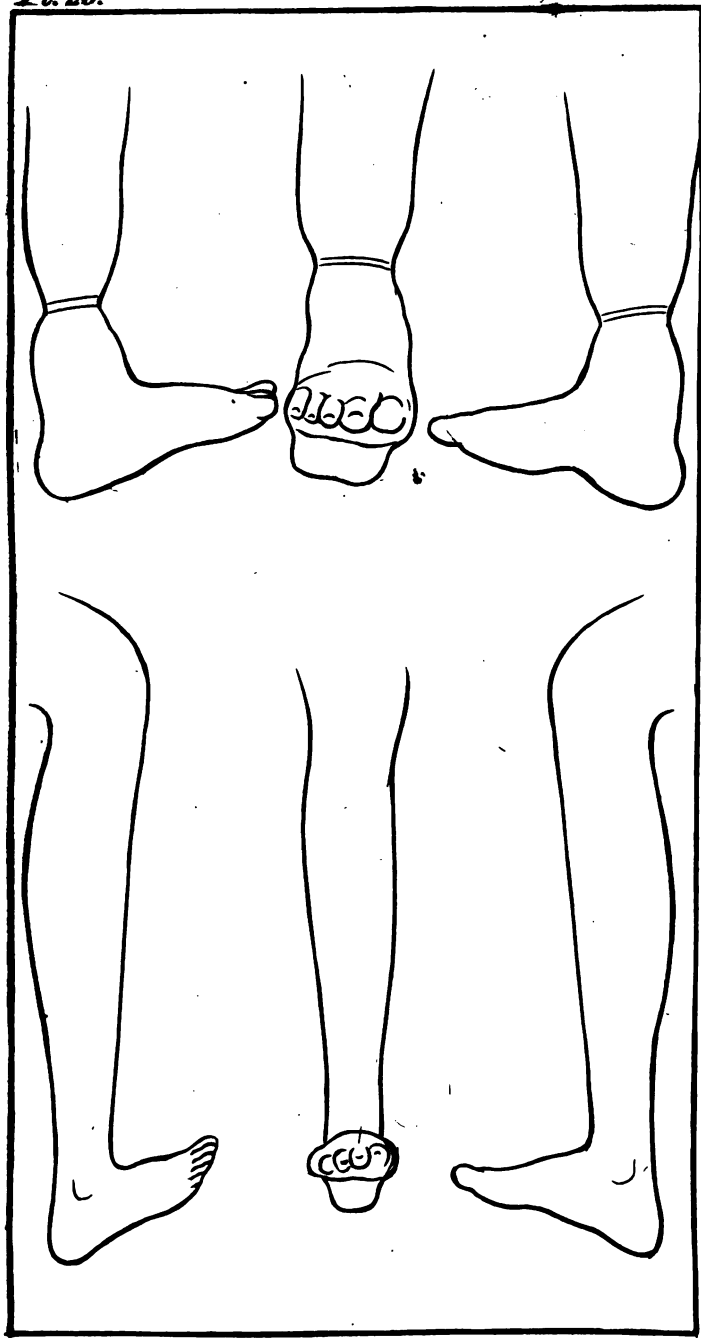
the dancing master, which had been carried to excess; in learning to dance, it is necessary to strain the toes; with the necessity, or the desire of this we have nothing to do; and it may be observed, that where the feet are well formed, the position is not inconvenient or injurious; but it will be explained in another place, that those feet which have the peculiar form here alluded to, are peculiarly weak when turned outwardly; of course, forcing them outward more than the natural functions of the feet require, weakens the capsular ligaments on the inside of the foot, and produces a weakness and disability, which is more disabling to bear, even in the lightest weight, though it is not so conspicuous in its appearance, and more difficult, and more tedious to cure when it becomes stricken, than any other deformity to which the feet are liable.

CASE XLIX.

In August 1808, Master F. was brought to me; he was then nine years old, his left leg about four inches shorter than his right, a defect that had existed, in some degree, from his birth, but seemed to increase as he grew, so that the defective leg grew less, in proportion, than the other; of course, the difference between them became greater as he advanced in life; he was healthy, and disposed to be active, but the very injudicious means that had been used with a view to assist him in walking, had very essentially injured his foot, by diminishing that degree of strength which it originally had.

He had very little power to direct the motion of his foot, which hung down in any position that the movement of his leg placed it in, and it had that elongation of the heel which always characterises valgus; but the most singular circumstance of this case, was an apparently ligamentous substance which passed round the bones of the leg, about three inches above the ankle; it had the appearance of a strong ligature, which compressed the fleshy part of the leg, and passed close round the bones, so that above and below the ligature, the leg was of the usual size; but where the ligature was, it was no larger than merely the size of the bones. I was told, this appearance was visible at the time of his birth; and had continued ever since; it had never been shewn to any professional gentleman, as it seemed to occasion no inconvenience; not very consistently with that declaration, they said; for he took much violent exercise, his foot swelled

Pl. 23.





to almost double the natural size, and became very painful, but subsided again in a few days: this inconvenience was, undoubtedly, occasioned by the constriction round the leg, whatever might be the cause of it, and I recommended that professional advice should be obtained, as to the propriety of attempting to divide the ligature; this was objected to: it is probable, that this circumstance was connected with some preternatural formation of parts, or, if it was not, it completely impeded the action of the gastrocnemii muscles, which must have rendered it impossible to restore the action of the foot, even if there had been no other impediment. For these reasons, I determined to support the foot by means of a high shoe and appropriate instruments, that should enable him to take any degree of exercise without improperly straining the ankle joint, as he had been accustomed to do: this was effected, and he walks firmly and easily; but the case appeared to be so singular, that I preserved a model of the foot, and in the annexed pl. 23, have drawn three views of it, which will give a very correct idea of the case.

CASE L.

Miss K., aged seventeen, was, in some degree, lame from her infancy; her parents had never consulted any person on the subject, but contented themselves with supposing, that as the lameness appeared to be but trifling, and did not seem to increase, it would disappear as she grew up; but as it became much worse within the last two years, and seemed to be still increasing, in October 1803, she was brought to me. She was remarkably tall and slender, her right leg was much thinner than the other, and she complained that it was not able to support her under the exercise it was necessary for her to take; her foot turned outwards, and the inner ankle was much nearer the ground when she stood upon it, than it ought to be, and this defect was visibly increasing. Upon examination it appeared, that when she endeavoured to raise the foot, it was lifted much higher than it should be, but when desired to point the toe and set *that* upon the ground, it was impossible for her to do so; the gastrocnemii muscles seemed to have entirely lost the power of contracting themselves; the tendo Achilles was small and flaccid, and appeared as if injured by a violent strain, the heel appeared to be elongated in consequence of the position of the astragalus behind the tibia, instead of under it, and the whole

foot was so circumstanced, that when she slipped forwards, her heel was first placed upon the ground, and, according to the care she took in walking, either the foot turned outwards and the inner angle came to the ground, which gave her much pain, or, if she was extremely careful, she could slowly place the foot flat on the ground; but this required so much time, that she could not do it when following her employment.

As no violence or accident could be assigned to account for this, there is little reason to doubt, that it was a slight case of valgus, in early infancy, and suffered to increase as she grew, till it had attained to the state in which I saw it: she resided at a distance from London, and was otherwise so situate, that she could not allow any attempt to be made to cure it; I was therefore only requested to adapt instruments to support her foot in the state it was, and enable her to walk with activity, without danger of increasing the deformity: this was effected, and in this situation she continues to walk without her foot having undergone any further alteration.

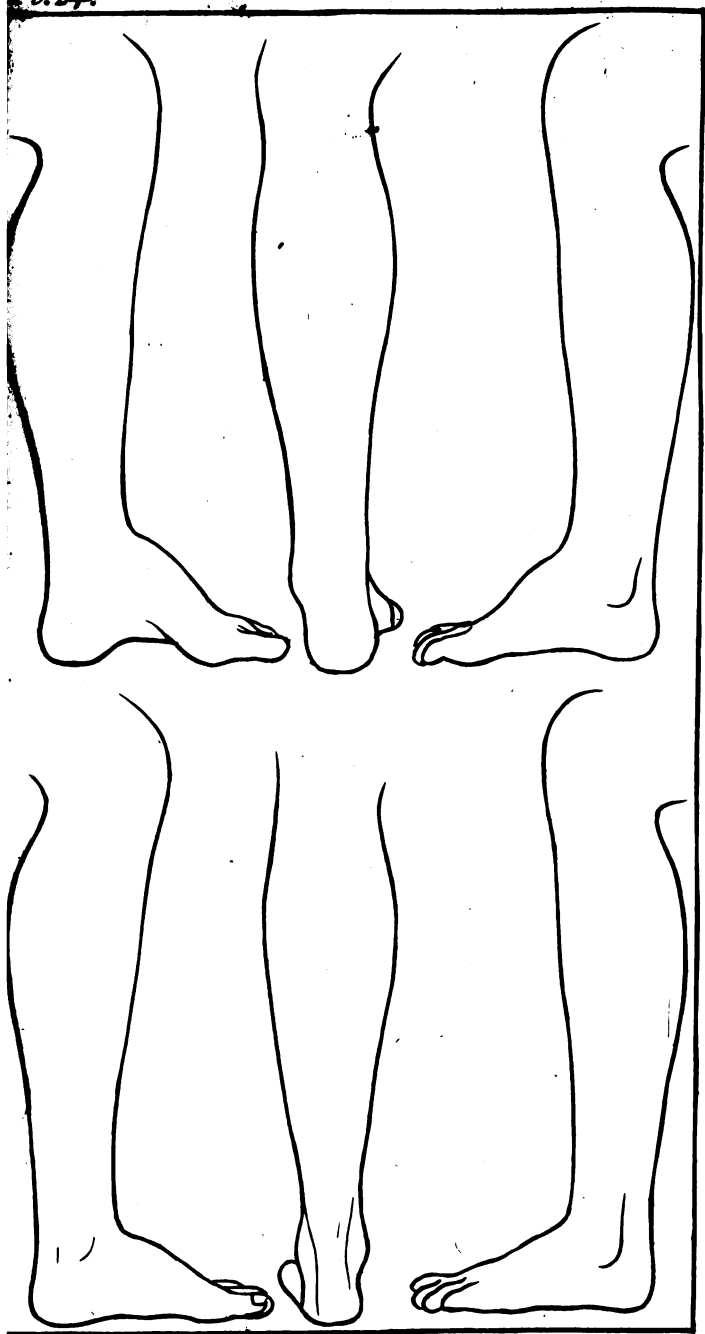
As the case is of importance, from its tendency to throw some light on the nature of the disease, I have, in the annexed pl. 23, drawn three views of the leg, to shew its general appearance.

CASE LI.

It was perceived, that Master T., at an early period of his life, had a defect in his left leg; his parents were unwilling to seek for any assistance, and hoped he would outgrow it, as they said; but it became gradually worse, till, the year 1803, when he was thirteen years old, they consulted me. He was remarkably tall and stout for a youth of his age, but his left leg was much smaller, and the foot much shorter than his right; he was unable to walk much, and when he did walk, his heel always touched the ground before the rest of his foot. Upon examination it appeared, that the heel was much elongated, as the astragalus lay behind the tibia; the arch of the foot was much higher than the natural form; this was occasioned by contraction of the aponeurosis plantaris pedis, which, at the same time, turned the toes inwards, and gave him a tendency to stand on the outer edge of the foot; the gastrocnemii muscles seemed to be unable to contract themselves so as to raise the heel, the whole leg felt soft and flabby, and had every other appearance of debility.

No

Pl. 24.



No attempt was made to account for this distortion, and there is every reason to believe, that it was originally a case of valgus, as the foot had, even when I first saw it, some peculiarity of form which attends that disease; these peculiarities escaped notice at the earliest period of life, but necessarily occasioned weakness: this weakness was increased by the exertions the child made to walk, and produced distortion and derangement in the action of other parts, till in the end the foot was rendered incapable of performing any of its own natural actions, and even but very imperfectly permitted him to stand upon it for any length of time, and, as every defect was increasing, it would, in all probability, soon have rendered the limb useless.

He remained under my care till May 1804, when he was so much recovered, that it only required a simple instrument to keep the foot in its proper position, till it had acquired strength enough to support itself.

At the time he was placed under my care, I had a model taken from his leg and foot, and another when the cure was complete. In the annexed pl. 24 I have drawn three views from each of those models, and by comparing them a correct idea may be formed of the alteration that was produced in the shape of his foot. Of the particular alterations that were produced, it may be necessary to say, that the astragalus was placed completely under the scaphoid cavity of the tibia, by which means the heel was shortened, and the foot placed in a proper situation to perform its natural motions, when its powers were restored. The arch of the foot was depressed, so as to bring the foot into its natural shape; and by the alteration in its form, the foot was made almost an inch and a half longer than it was in its deformed state.

The action of the peroneus longus muscle was so restored, that he could turn his foot *outwards*, as well as his other foot; a power which he never had before. The gastrocnemii muscles had likewise required their strength and tone, so that he could move his foot in any direction, as well as he could his other foot. I have heard from this patient several times since, and have the satisfaction to know that he continues as well as when he left London, is capable of taking much exercise without any inconvenience, but has not yet sufficient strength to go without those bandages, which it will be prudent for him to continue to use till his leg has acquired its full proportion of strength.

OBSERVATIONS ON VALGUS, AND CURVATURE OF BONES OF THE LEG.

In dividing distortions of the feet in children into two classes, which have been called Varus and Valgus, from the position of the feet, in the former class, the feet being turned inwards, and in the latter, outwards, the most superficial view of the diseases has been taken, and the most incorrect ideas of them have been adopted; it has been conjectured, that the unnatural position of the feet constitutes all the disease, and, of course, that nothing more is necessary to effect a cure in every case than to twist or turn the feet about into their natural position again; that when this is done, nothing more is required, and the patient becomes well of course: but, upon investigating the subject more accurately, it will be found, that the causes of the two diseases, the consequences as they affect the parts that are concerned in them, and the alterations that are to be produced in those parts, in order to effect a radical cure, differ from each other in the treatment of the diseases in question, as much as the two diseases differ from each other in their general appearance.

In many cases of varus there is so much evident deformity, from derangement in the relative position of the bones of the foot, that it is, most commonly, suspected there is a deficiency in number, and in the form of the bones, or both: in most cases of valgus, there is no evident deformity in the foot, consequently the foot is not, in general, thought to be defective. In the worst cases, the deformity of the foot is but little; and the real cause of the defect, so far as I know, has never been pointed out. In varus, the extensor muscles of the foot are deficient in action, or unable to act at all. In valgus, the extensor muscles are always acting, and the flexors are deficient in that respect. In varus, the *apparent deformity* is commonly supposed to constitute the whole disease, and when the foot *assumes the natural form*, it is falsely supposed to be well; while in valgus, the distortion of the foot is scarcely an object of attention; but the principal object is to restore the muscles to their power of action, and, what is on many accounts a most unpleasant circumstance, that in these cases, where the apparent deformity is so little, the cure is infinitely more tedious than in very bad cases of varus, where the deformity is so striking, and the removal of it occasions the strongest surprise to the uninformed observer.

There

There is reason to believe, that valgus is always occasioned by improper position of the foetus in utero; it is easy to understand, that whatever may occasion a sudden change of position in the foetus at that time, may occasion its feet to turn outwards instead of inwards, in the natural state; and, here perhaps, a fright, or other accident, happening to the mother, may be fairly assigned as a cause of the distortion: if the feet should, by whatever means, be suddenly so far turned out that the bottom of the foot should bear against the containing parts, it will be prevented from returning into its natural state; and the uterus, resisting the action of the foot, and endeavouring to preserve its ova-like form, will press the foot upwards, the ankle joint will give way, till the upper part of the foot comes into contact with the leg: if the foot takes this position but a short time before the birth, the effect produced will only be a little elongation of the heel, with a constant tendency of the child to raise its foot, and an incapacity in the gastrocnemii muscles to act so as to draw it down again.

If the position has been taken at an earlier period, or if the compression has been more violent, the foot will be pressed closer against the leg, the heel will be much longer, the tendency to lift the heel, and the incapacity to draw it down more evident: if the distortion goes to its greatest extent, the astragalus will be thrown completely out of its situation and placed behind the tibia, the heel becoming, in consequence, very long; and the foot, by being pressed close against the leg, will become quite flat; or, if it preserves its own form, it will, by pressing against *that*, distort the bones of the leg. I have seen two cases, where the feet were as flat as any hand could be when held quite open, and many in which the bones of the leg were evidently bent from this cause.

Sometimes the foot will be raised directly upwards, so that its top will be in contact with the front of the tibia; at others it will be obliquely outwards, so that its top will lay partly against the tibia and partly against the fibula; in either case, the astragalus will be plainly perceived out of its proper place, and laying behind the tibia, thus giving the appearance of uncommon length of the heel.

Those who understand the structure of the foot will perceive, that if any permanent resistance is placed under its bottom, and so circumstanced as to lift it upwards continually, the astragalus will be thrown backwards till it must be behind the tibia and thus give the appearance of

of uncommon length to the heel, a circumstance that is always visible in cases of valgus.

In varus, the defect in the muscles of the foot is in the extensors; they are incapable of acting so as to lift the foot; the flexors are always acting, and these contracting themselves continually without being opposed by any counteracting power, increase the deformity; but in valgus, the facts are directly contrary, the flexors are incapable of acting, and the extensors are continually lifting the feet, without any counteracting power being opposed to them; consequently, when the distortion of the foot is directly upwards in front, this peculiar action of the muscles throws the heel upon the ground before any other part of the foot, which was always the case with the patients whose feet are represented in pl. 23; or, if the feet are turned outwards, the same action produces a similar effect, with this difference, that, in proportion as the foot turns outwards, it is defective in the firmness of the support it gives to the body: as the patient stands upon it, the inner ankle approaches nearer to the ground, till at last the foot rests entirely upon the inner side of the astragalus and the extremity of the tibia; a case very similar to this is represented in pl. 22.

An examination of the structure and uses of the muscles of the foot will shew the reasons for this difference: the extensor muscles are wanted only to raise the foot, when we lift it from the ground; the flexors are not only requisite to counteract that movement, but they are the powers by whose combined action the whole body is raised and moved forwards in the act of walking, and in every action in which the body is moved in any manner, whether merely in loco-motion, or in exertions of strength: the power of these muscles, when at maturity and in perfection, is immense; and it is by the incipient action of these muscles, if such a term may be used, that the feet of children, before they begin to stand upon them, appear to be drawn inwards and upwards; they are most so immediately after the birth, and this appearance diminishes gradually; till the child walks: in varus, the astragalus is thrown forward, and the heel raised upwards, by which means the action of the flexor muscles is rendered more powerful, while the counteracting power seems to be lost; but in valgus, the reverse of this is the case; by throwing the astragalus backwards, the power of the extensors is increased, and the counteracting power of the flexors lost: and if this takes place in the earliest period of life, they will

will never acquire power to lift the body at all, the legs waste in size and become debilitated, to a degree from which it is more difficult to recover them at any advanced period of life, than it is to cure any case of varus whatever.

It is from this peculiar action of the muscles of the foot, that some of the slightest cases of valgus which are perceived to exist at the time of the birth, disappear of themselves soon afterwards: two cases of this kind have been mentioned; in these the absolute deviation from the *natural form* was but trifling, but the deranged action of the muscles was evident; the children appeared always to lift the feet upwards, but were very defective in power to move them the contrary way: by the natural struggles of the children to use their legs, however, the flexor muscles regained their natural tendency, and without any artificial means being used, they were brought as perfectly upon their feet, as if they had never been deranged.

The very slightest cases of this description, however, when perceived to exist, should be watched with the utmost care; for, if the deranged action does not cease in a short time, it will certainly increase, and no time should be lost in keeping the foot in its proper position, and so regulating its motions as to force it to move in the natural manner: by doing this at the earliest period of life, the defect may be removed in most cases before the child begins to walk; if it is not removed before that period, it becomes extremely tedious to cure, and if still farther neglected, lays a foundation for the most incurable lameness.

It is probable that this distortion of the feet outwards, and the inner ankle falling towards the ground, frequently takes place without any pre-disposing peculiarity of form. I have seen it, in very numerous instances, in children between the ages of ten months and three years, and evidently the consequence of laxity in the ligaments of the ankle joint; it is produced either by constitutional debility, or accidental temporary illness: in the course of the last year, I saw more than twenty bad cases of distortion of this kind, all of them in girls between the ages of eight years and fifteen, and all of them produced by the imprudence of their dancing masters.

In teaching children to dance, it is customary to make them turn out their toes as much as possible, and many ingenious methods, such as the use of stocks, &c. are practised, to compel them to do so; let it be granted,

that in dancing it is necessary to turn out the toes, which may be done to the necessary extent, without any danger whatever; the objection is not to the practice, but to the abuse of it; many practice that like other arts, without understanding the principles upon which the practice is founded; such men substitute industry for reflection, and, having learned rules of practice from those who are more intelligent, think they cannot carry the observance of those rules to extremes that may be hurtful; it is by the injudicious conduct of such men that distortion is produced, when they are in search of grace; and, some anatomists having seen the mischief that has been produced by the use of imprudent methods to turn the feet *outwards*, have advanced an opinion, that this is an unnatural position for the feet, which nature intended to turn *inwards*; the former part of their opinion is true, the latter, in all probability, is not so.

Perhaps that may be justly called the natural position of the foot, in which we can place it so as to preserve its position for the longest time, and make the greatest exertions of strength or agility, under all the various circumstances under which it may be compelled to act: if this explanation be just, it will lead to a view of the subject that is, perhaps, different from what has been generally entertained.

Whoever will take the trouble to make experiments on the subject will find, that he can make the greatest exertions, and for the greatest length of time, whether in walking, running, jumping, or any other active exercise or exertion, when his feet are so placed that the inner edge of the great toe is in a line with the center of the patella; and an attentive examination of the structure and uses of the different parts of the foot, will convince the anatomist that this must, inevitably, be the case.

The foot has three distinct motions under the leg: 1st. Supposing the foot to be fixed, the leg moves directly backwards and forwards over it, as, in what is called, the ginglymus joint: 2dly. Supposing the leg to remain fixed, the foot may be moved so as to turn the great toe inwards towards the opposite foot; and 3dly. Keeping the leg in the same position, the foot may be turned outwards, so as to bring both heels in contact, and let the toes diverge from each other in an equal degree: in effecting these motions, different muscles are employed, and act, according to circumstances, as flexors or extensors, in opposition to each other; but when the foot is placed in the position
I have

I have described, and it is intended to raise and move the body, every muscle of the foot combines with the heel to produce that effect; the flexor digitalis pollicis pedis, and plantar aponeurosis, the tibialii and peroneii, combine with the gastrocnemii muscles to raise the body; but when the toes turn inwards, it is by the contractile action of the tibialii muscles, and the peroneus longus and brevis relax, but resume their contractile action when the foot turns outwards, and the tibialii relax in their turn: in consequence of this arrangement, if a man runs or uses any violent exertion with his feet turned more inwards than the position I have described, he will be weaker upon his legs, more apt to stumble, and thus luxate the ankle joint outwards; if he turns his feet more outwards, he will be weaker, less fit for exertion, and liable to luxate the ankle joint inwards; but if he keeps his feet in the position that I have described, he will be capable of the greatest exertion, and for the longest time: it is the position in which the skater places his foot when he moves his body *from* it to his other foot; he exerts all his strength to do this, and every one who is accustomed to that exercise, knows that he can follow it for a longer time, and continue a greater degree of exertion than he can in any other manner.

If this fact was kept in view by those who are employed to teach young people what is thought to be conducive to firmness of gait and elegance of deportment, they would succeed with more ease and certainty, than by adopting practices of which they do not see the impropriety or pernicious tendency.

The position of the fibula, on the outside of the foot, is such as to prevent the foot from being turned outwards beyond a certain point, without one of two circumstances taking place; either the fibula must bend, or be fractured before the foot can turn outwards, or, as that very rarely happens, the capsular ligaments must be strained on the inside, so as to let the foot turn outwards, and the extremity of the tibia come nearer to the ground. It is in this manner that this kind of distortion is generally produced; it was so in all the young ladies that I have mentioned, and in two adults that I have seen in a similar situation; the symptoms in all were the same, varying only in degree, viz. the feet turned outwards much more than is usual; the extremity of the tibia on the inside coming very near the ground; inability to move the foot freely in the natural direction, even when it was held from

the ground, incapacity to walk much under any circumstance, and much pain in the joint upon taking the least exercise.

By whatever cause valgus is produced, or whatever the age of the patient may be, it is of importance that it should be seriously attended to at the earliest period, because that state of parts that constitutes the disease is always very tedious to remove, and, if suffered to exist long uncontrolled, will lay the foundation for lameness almost incurable, with but little visible deformity; at least, deformity that appears to be trifling in comparison with many other cases.

The two most important circumstances in this disease are, debility in the capsular ligaments, and debility in the flexor muscles of the foot; the texture of ligament does not easily alter under any circumstances; it will resist violent actions for a considerable length of time; but if that texture be altered by violence, such as luxation, or similar derangement, its original healthy state is not easily restored; it is most easily restored within a short time after it has been strained after the accident; but if that time is suffered to elapse without well directed efforts to restore the ligament to its natural state, it is familiarised to its new condition, which becomes, if it may be so said, natural to it, and it is afterwards very insusceptible of alteration: this insusceptibility for alteration in the state of ligaments, increases always in proportion as the patient advances in life; for this reason it is that sprains in the joints, if they are not effectually cured soon after the accident that produced them, are seldom effectually cured at all, but entail upon the sufferer an annuity of pain for life; and, reasoning by analogy from these facts, it is easy to understand, that a child which has a distortion of the feet that is accompanied by a similar state of ligaments would, at an early period, be cured in a moderate time, differing, in different patients, in proportion to various circumstances in their constitutions; but if the same patient be suffered to advance farther into life, walking upon its feet without support effectually given to the defective limb, the distortion would continually increase as well as the debility, till the state of the ligaments would render the cure infinitely tedious when undertaken, and at last, perhaps, irremediable.

The deficiency in the muscles in this disease, is incapacity in the flexor muscles of the foot to perform its functions: in the natural state, the flexor muscles of the
foot

foot move the whole body from one place to another, with the degree of strength, that all the variety of our exertions require; for this reason they are, perhaps, stronger than any other muscles of the body; the tibialis anticus and extensor muscles of the toes are only required to move the foot in the direction it is placed when we lift it from the ground; yet, in the disease in question, these muscles only act, they continually lift the foot upwards, while their antagonists have not power to counteract them, notwithstanding they ought to do so, and move the weight of the body, in any situation, besides. Hence it is evident, that in curing this disease, we are not only to place the bones of the foot in their proper situation, and support them there till the capsular ligaments have strength enough to perform their own office, but we must take measures to restore to the muscles of the foot, the power of performing their natural functions; a process that is tedious under the most favourable circumstances, but will be rendered infinitely more so in proportion to the time that the disease existed, and the period of life at which the cure is undertaken.

Distortion of bones of the legs in children may be divided into two species, viz. such as are from original formation, and those which are produced by various accidents afterwards; of the former I have seen various instances, but as no author that I know of has considered this as a common disease arising from that cause, it may be useful to explain it, as it appears to be accounted for in those cases which have fallen under my observation.

If that unusual position of the foot, which produces valgus before the birth, be attended to, it will be evident, that if the bones of the leg preserve their form, the foot must be flattened, as it is pressed against them, and thus that peculiar form and position of the foot, called valgus, is produced; on the contrary, if the structure of the foot is sufficiently strong to preserve its form, when forced into that unnatural position, then the bones of the leg give way, and become curved; this curvature may take place in various directions, but most of the cases that I have seen, have been distorted nearly in the direction of that which is represented in pl. 18. This kind of distortion exists in a greater or less extent in different patients; but whenever it does exist, even in the slightest degree, it should be removed as early as possible.

The imperfect attention that has been paid to these diseases by professional men, has left them entirely to the
care

care of the Sybils of the nursery; the ignorance and presumption of those persons, together with their prejudices, have given too much currency to an opinion, that these distortions in the limbs of children will disappear without assistance, as the child grows up. It has been shewn, that the slightest cases of valgus have sometimes disappeared within a short time after the birth; but if this does not happen in a very few weeks, it does not take place at all; the reason for this difference of the event of cases which cannot, *a priori*, be distinguished from each other by any visible appearances, has been explained; but no case of distortion in the bones of the leg that I have seen, and that has been produced by the cause at present under consideration, has ever shewn the least tendency to diminish without the application of proper means to produce that diminution; and a little attention to the circumstances of the malady will prove it to be extremely probable, that any disease, of curvature of bones of the leg, never can be diminished by the efforts of nature, without the assistance of art. The peculiar action of the flexor muscles of the foot is to move the body after the period that children begin to walk; the exertions made by infants before they walk, are calculated to train those muscles, if the expression may be used, till they acquire the power of performing their natural action: if we keep this fact in view, and consider that the gastrocnemii muscles are principally concerned in this movement of the leg, we shall perceive, when the bones of the leg are bent directly, or nearly directly forward, they form a bow, the cord of which is represented by the gastrocnemii muscles and tendo Achillis; now as the arc of the bow is formed of flexible materials, and is already bent too much, every movement of the leg, by the contractile action of those muscles which represent the cord, has a tendency to increase the curvature; and as the power of the arc to resist, diminishes in proportion as the curvature increases, the disease must go on increasing, with an accelerating progress, in proportion to the increase of the time it has existed; this is the state of the disease *before* the child attempts to walk; after he does walk, the weight of the body is an additional power added to produce additional deformity: from this state of the facts it will appear, that by imprudent neglect, or attention to the advice of ignorant persons, a distortion which at its first appearance might be removed in a very short time, if neglected for even a few months, may be so increased, that

that it cannot be entirely removed in less than one, two, or three years.

Another fact is likewise entitled to particular attention, viz. that distortion of the foot, which is called *valgus*, and takes place before the birth, is, as well as that curvature of the bones of the leg which is now under consideration, the consequence of the same unnatural position of the fetus in utero; yet, the effect of the former, so far as the muscles are concerned, is debility in slight cases, and, in more serious cases, a total incapacity for action, in the flexor muscles of the foot; but in curvature of the bones of the leg, so far as the muscles are concerned, the defect is excess of action in the same muscles; here are two effects directly opposite to each other, produced by the same cause.

Curvature of bones of the legs in children, is frequently produced by rachitis, and sometimes by debility, unconnected with that affection. When rachitis is the cause, the effect is first perceived in the enlargement of those extremities of the bones of the leg which form part of the ankle joint; the enlargement of those bones proceeds gradually upwards, till they are affected in their whole length; the legs begin to bend, sometimes directly outwards, sometimes laterally, and very frequently the curvature proceeds in both directions: in these cases it is but too common to wait, in hopes that the distortion will disappear without assistance, as the child grows up; it is always right to adopt the appropriate treatment at the earliest period of the disease, which would then be easily remedied; but by suffering the distortion to increase for a great length of time, the trouble and difficulty in curing it is much increased; the variety of form into which the legs distorted from this cause, are twisted likewise, increases the difficulty of curing them, and the time necessary to effect the cure.

When distortion in the bones of the legs takes place from mere debility, they most commonly bend in one direction only, either directly forwards, or laterally; the compound curvature, if the expression may be adopted, seems to be the appropriate mark of distortion from rachitis; but whatever may be the cause of the disease, it is of importance that the cure should be undertaken as early as possible; for, as the cure consists in altering the form of individual bones, it is important that they should be restored to their natural shape before the progress of ossification renders them too firm to be acted upon, with-
out

out injury to the softer parts that cover them : it is possible that the bones may be susceptible of being acted upon at a much later period in life, but though I have found that in the earlier periods the success has been complete, yet, in such cases as I have been induced to attempt in patients past the age of six or seven years, very little progress has been made towards eliciting a radical cure.



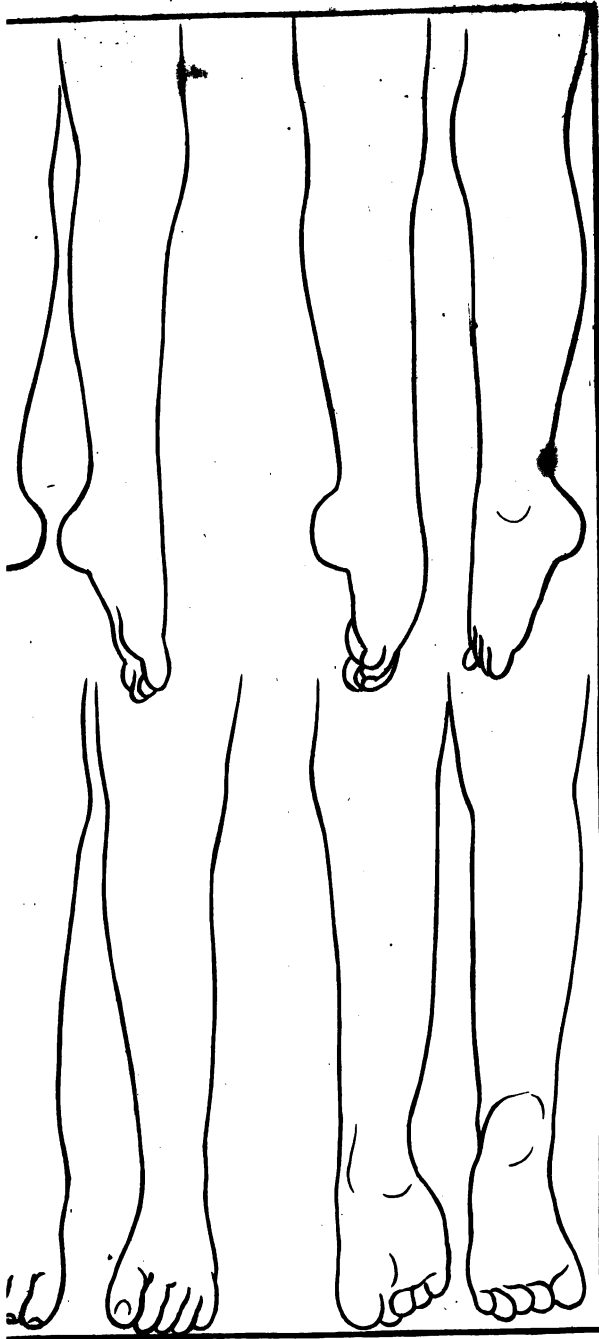
CASES OF DISTORTION FROM CONTRACTION.

CASE LII.

Miss H. was born with both her feet distorted ; the gentlemen who were consulted soon after the birth, advised that nothing should be done at that time, as they thought the deformity *might* disappear as she grew up, or, if did not, by postponing the attempt to rectify it till she was grown older, she would have acquired strength to support the operations that would be necessary to reduce her feet to their natural state : this reasoning was not the most accurate that might have been used, nor their advice the best that might have been given on the subject, but it was acted upon till August 1805, when she was placed under my care, being, at that time, two years and a half old.

Her heels were drawn upwards, so that, in the foot that was least distorted, a line drawn straight down the front of the leg would have passed along the top of the foot to the great toe without varying in the least, as there was no bend whatever in the foot ; the right foot was more distorted, as the toes, from the junction of the metatarsal bones with the bones of the tarsus, bent round towards the soles of the feet ; each foot was rigidly confined in its deformed state ; it had neither power or inclination to move any part of the foot ; one of the legs she moved very freely at the knee joint, the other was capable of very little motion, and, upon examination, there appeared to be a peculiarity of form in the joint, which was not very intelligible.

I was told, that at the time of her birth the toes of both feet were much more turned round than when I saw them ; this defect had been diminished by the nurse constantly endeavouring to turn the toes gently more outwards, and, in some degree, the effect had been produced :
the



out injury to the softer parts that cover them : it is possible that the bones may be susceptible of being acted upon at a much later period in life, but though I have found that in the earlier periods the success has been complete, yet, in such cases as I have been induced to attempt in patients past the age of six or seven years, very little progress has been made towards effecting a radical cure.

CASES OF DISTORTION FROM CONTRACTION.

CASE LII.

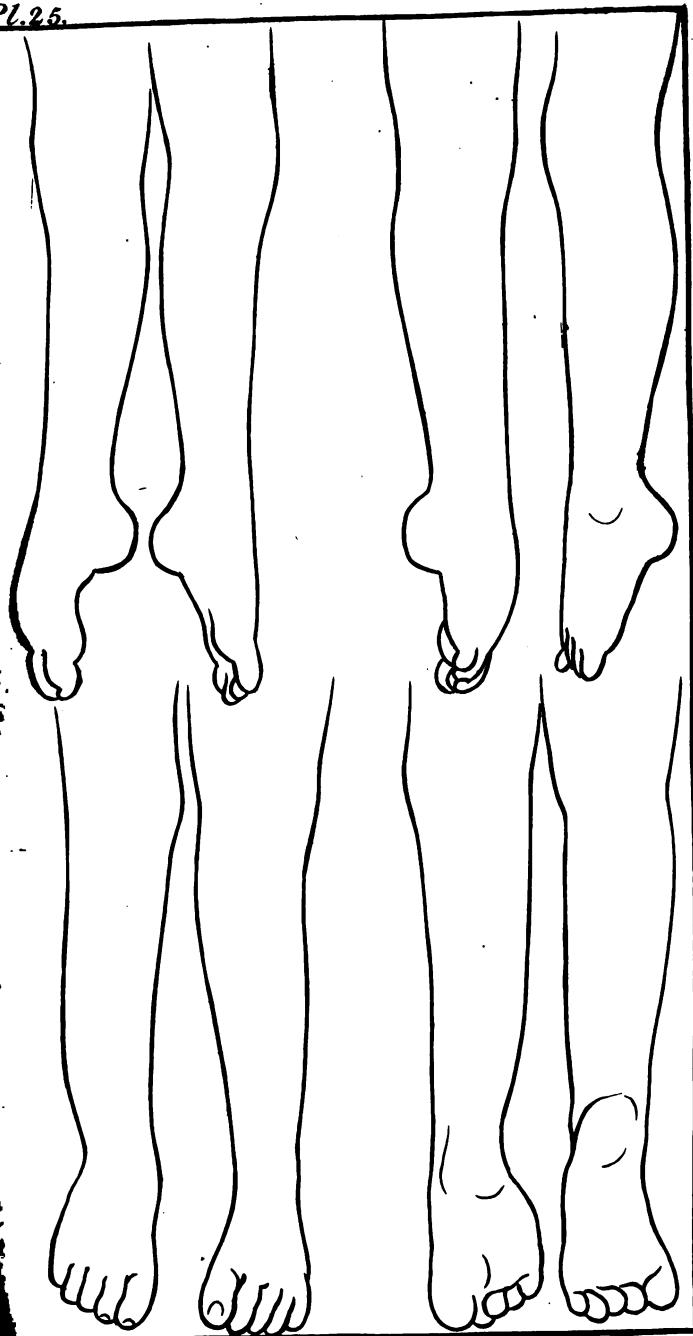
Miss H. was born with both her feet distorted ; the gentlemen who were consulted soon after the birth, advised that nothing should be done at that time, as they thought the deformity *might* disappear as she grew up, or, if did not, by postponing the attempt to rectify it till she was grown older, she would have acquired strength to support the operations that would be necessary to reduce her feet to their natural state : this reasoning was not the most accurate that might have been used, nor their advice the best that might have been given on the subject, but it was acted upon till August 1805, when she was placed under my care, being, at that time, two years and a half old.

Her heels were drawn upwards, so that, in the foot that was least distorted, a line drawn straight down the front of the leg would have passed along the top of the foot to the great toe without varying in the least, as there was no bend whatever in the foot ; the right foot was more distorted, as the toes, from the junction of the metatarsal bones with the bones of the tarsus, bent round towards the soles of the feet ; each foot was rigidly confined in its deformed state ; it had neither power or inclination to move any part of the foot ; one of the legs she moved very freely at the knee joint, the other was capable of very little motion, and, upon examination, there appeared to be a peculiarity of form in the joint, which was not very intelligible.

I was told, that at the time of her birth the toes of both feet were much more turned round than when I saw them ; this defect had been diminished by the nurse constantly endeavouring to turn the toes gently more outwards, and, in some degree, the effect had been produced :

the

Pl. 25.



of the foot, in the manner of that represented in pl. 28; her knees bent inwards, and she was incapable of walking by herself, though when held by an assistant, she could move forwards very slowly and imperfectly, for as her knees bent inwards and forwards, they struck against each other, and to avoid this, when she moved, she made a circumflex motion with each leg, apparently by the action of the muscles of the thigh only, as there was no voluntary motion of the knee joint, or any part below it.

After she had been cured of the paralytic affection, various means had been used to remedy the remaining defect, viz. electricity, frictions, warm and vapour baths, &c. &c.; but as these remedies were certainly applied upon false principles, no benefit whatever had been obtained from them; on the contrary, her limbs were becoming more rigid and distorted, and, as a last resource, I was applied to.

Upon examination I found, that, by some exertion, her feet might be placed in their natural situation, and, when some force was used, might be retained in it: that, when she was seated, she could bend her knees without difficulty, but that it required much force to straighten them again; though when straight, they might easily be kept in that position; the radical defect was a total want of power in the extensor muscles of the legs and feet; the immediate effect of that defect was, incapacity of voluntarily moving the legs and feet, in a natural manner; the direct consequence was rigidity in both the limbs, and the remote consequence would certainly have been a permanent contraction of the whole.

It is well known, that patients who are afflicted with palsy in the legs and feet, less frequently recover the perfect use of those limbs, than other patients recover from the effect of palsy in other parts: in another place I have suggested, that this is a consequence of the relative power and functions of the flexor and extensor muscles of the leg and foot; in other parts, in the arms, for example, which are required to perform a variety of motions, and whose strength is to be exerted in various ways, the flexor and extensor muscles are equal in power; but the continual functions of the legs and feet, are to move the body in every manner that may be necessary, which motions are performed by the contractile action of the flexor muscles of the legs and feet, provided, of course, with extraordinary power for that purpose; but the extensor muscles are only required to move the legs forward, as preparatory to the next motion: thus when a man walks, the flexor muscles

the child had never shewn the least inclination to use her feet, and no attempt had ever been made to place her on them.

The peculiar position and form of the feet constituted the singularity of this case, and distinguishes it from every other that I have seen; several cases of similar deformity will follow this, but they all took place from different causes, and at different periods, *after the birth*. In every case of varus; there is as much or more distortion of the bones of the foot, but there is, besides, a lateral curvature of the bones of the foot, with respect to the leg, which gives them a different character from this, which is, so far as my experience goes, an unique as well as singular instance of this kind of distortion, taking place before the birth.

In three months after this case came under my care, the form of the feet was so much altered, that she could stand upright, with the soles of her feet on the ground, but she had not then acquired the power of moving them in obedience to the will: much of this power has since been gained, and the cure is proceeding in such a way as authorises a conclusion, that in due time she will obtain the full use as well as the perfect form of both her legs.

This case should not have been reported in its present stage, but for the circumstance of my having had several cases of similar deformity in young children, and, not having been permitted to take models from those cases, the description of them would not be so intelligible as where a visible representation can be given. I did take models of both this child's legs, and in the annexed pl. 25, I have drawn four views from each of the models, which will convey an accurate idea of the original state of this case, and illustrate several of the succeeding cases, which resembled it in point of form in the distorted limbs, but of which I was not permitted to preserve any representation.

CASE LIH.

Miss C., aged between four and five years, had, two years before, been afflicted with a paralytic stroke, which deprived her of the use of both her legs; this disease long resisted the attempts that were made to remove it; at length had been cured, some months before I saw her, but she was still unable to walk.

When supported by an assistant she could stand, pointing her feet very like those represented in pl. 25, but bending at the toes, so that she stood upon the fore part

mily went into the country; as I am aware that many, with the best intentions, are unable to execute, and that others will not persevere in any plan of this kind, I had little expectation that any solid benefit would be obtained by this patient, and was, therefore, agreeably surprised by receiving a letter, of which the following is an extract.

January 30, 1806.

DEAR SIR,

It is now six months since I had the pleasure of seeing you in town, a lapse of time which affords me an opportunity of saying something on the progress which the little girl, under my protection, has made towards the use of her legs.

I did not expect, at the time I left town, I should have occasion to remain so long in the country; but from the benefit I have received in my health, and the advice of my physician, I have resolved to remain till the end of the ensuing summer. This resolution deprives me of the wish I had for you to have seen the little girl, at this time in town: I shall, however, state as full as I can, all that I have observed in the way of change or benefit, and take the liberty of suggesting any thing that may occur to me, that may appear of any use to the subject.

I took the earliest opportunity of endeavouring to bring about your plan of making her sleep in her instruments, as most likely to affect an earlier cure, which I found no difficulty in doing, taking them off at proper intervals, to change her stockings, bathe her feet, and try the use of her limbs. *I confess, I was much surprised to see her so soon move about in great freedom with the instruments, which I expressed my apprehensions to you were too HEAVY.* Your plan for keeping the foot flat, I conceive to have been of most essential benefit to her, for she *now puts her feet flat and fair to the ground*, which before was not the case, moving, as she did, chiefly on the balls of her feet, with her knees much bent, and the whole of her limbs inclining inwards, I may say, from the very top of the hip bone. Your invention, therefore, *by forcing her in her step to a straight knee, has certainly been of great use.*

When I practice her without her instruments, I observe a great weakness still to hang about her knees, and she, herself, complains of it. I observe, also, that without her instruments,

instruments, when she attempts to move a little faster than the common step, her limbs still shew a disposition to turn inwards, and the knees, when they bend, bend considerably towards each other; I have observed, therefore, the necessity of keeping the straps tight, which draw the knees towards the instruments, &c. &c. &c.

Her feet now seem to turn out much more, and she seems to have a command of them, so as to turn them out herself, when her instruments are off, which she could not do before; I am therefore of opinion, that the instruments being constructed to turn her feet out still more will be of greater service to her.

I find that six months have not only made a considerable difference in her growth, but an evident one in her strength; the situation I am in is high and dry, and, I think, very healthy, and must have been as beneficial to her as to me, &c. &c.

Nothing can be more intelligible and explicit than this gentleman's letter, it proves that she has acquired considerable power to move, and direct her limbs in the natural manner; but that it is evident, and she herself is sensible, that there is much weakness remaining; when she goes without her instruments, her limbs still shew a disposition to turn inwards. These observations demonstrate, that the opinion formed on my first examination of this patient was correct, the system of treatment that was adopted in consequence was effectual, and the degree of benefit that has been received proves, that nothing but steady perseverance is necessary to render the cure perfect and permanent.

CASE LIV.

I was desired to see Miss W., who had an affection of the spine, which had deranged the whole nervous system, tending particularly to the head, and entirely depriving her of the use of her legs: the most alarming symptoms of the disease were removed, and it was supposed that it was entirely eradicated; but her legs, though the paralytic affection was, in a great degree, removed, continued useless; their position resembled those which are represented in pl. 25, and they had no voluntary motion lower than the knees; when held by an assistant, she rested upon her toes, and, whatever attempts she made to walk;

walk, when thus supported, she could but very imperfectly step from one foot to the other.

Her right foot was permanently and rigidly fixed in the position that I have described; the left foot had taken the same position, but did not appear to be so rigid. The gentleman who attended the patient during her illness, was of opinion, that the disease was entirely eradicated, that the defect in her legs was a little stiffness, from want of action, which was diminishing daily, but the removal of which it would be better to assist by mechanical means, and that she would get well in a short time.

I agreed as to the certainty of restoring the form and action of the parts, but having a very different opinion of the cause of the defect, I necessarily differed as to the consequences, and the ultimate cure. Having seen many similar cases, I suggested that all this child's complaints were the effects of a general derangement of the nervous system; that the more important effects of that disease were, indeed, removed, but the state of the feet proved, that it still existed in the constitution; that the deformity of the feet might be removed in no great space of time, and their action, *pro tempore*, be restored; but, the producing cause still existing, the defect, both in form and action, of this child's feet would, in all probability, return, unless they were carefully and skilfully attended to for a long time; my opinion was treated as chimerical, and I was requested to use my endeavours to reduce the feet to their natural form.

In December 1804 (being at that time three years old), she was placed under my care. In June 1805, both her feet were completely reduced to their natural form; and they were capable of motion to the full extent that they should be able to move; but there was an essential difference between them, the right foot, which had been most rigidly contracted, had acquired a considerable degree of *voluntary* motion, at the same time that it regained its form; whilst the left, which had been less rigid, and had been sooner reduced to its natural form, had very little *voluntary* motion, though it was easily moved into any position, that it should be placed in; it was flaccid, had very little sensibility, and had still much the appearance of being under the influence of palsy, though the right foot was, undoubtedly, in a healthy state. My opinion as to the necessity of farther attendance on this case being over-ruled, and the family being on the point of retiring into

into the country, I was requested to provide such instruments as would enable those who had the care of the child to preserve the advantages that had been gained; this was complied with, and I was informed by the gentleman who attended the family, that to their great satisfaction, the child continued quite well. In November her father told me, she was not quite so well; and, I have since learned, what I always thought would probably happen, that she has relapsed towards her former state; whether from the disease coming again into action, or in consequence of her attendants, however well disposed they may be, not being able to keep them in a situation that would preserve the advantages that had been gained, it is impossible for me to determine.

CASE LV.

Miss G., at an early period of life, had a fever, and, at the same time, was deprived of the use of both her legs by a stroke of the palsy; she recovered her health, but did not recover the use of her legs, but was either drawn about in a chaise, or permitted to crawl about upon the ground; in consequence of the position she was kept in by this action, her feet were both contracted in a position very like those represented in pl. 25.

In this situation she was when I saw her in October 1798, she was then between three and four years old: there was little reason to suppose that the use of her legs could be restored; but it was reasonable to believe, that if her feet could be placed flat under her, that artificial means might be contrived that would enable her to walk, and if this could be effected, her situation would be much better than it would be in the state she then was. In three months the feet were reduced to their natural position, so that by the assistance of proper instruments, she was enabled to stand upon them, and in the progress of time, was enabled to move about upon them, with the help of an assistant, but her legs and feet did not acquire size and strength; on the contrary, her general health was good, she grew tall, but her legs remained flaccid, had very little feeling, and wasted continually, but still she continued to walk in the imperfect way I have mentioned for three years that she remained within my knowledge. I have since lost sight of her, and know not what is her present situation.

There can be little doubt that this was a case of true palsy,

98
of course, totally different from those cases of limbs wasted from want of action, or distorted from distorted action, all of which are capable of being alleviated, and many of being cured; but in this case no other benefit could be expected than what was obtained.

CASE LVI.

Miss W. had no apparent defect or deformity till she should have begun to walk, when it was perceived, that instead of placing her feet flat on the ground, she rested upon her toes only: this peculiarity so increased, that she always rested upon her toes when she was placed on the ground, and could not walk alone; but when supported, walked very imperfectly, and had by no means the power of directing their motion. In September 1802, she was brought to me, being then aged three years and a half; at that time her legs nearly resembled those which are represented in pl. 25, but were not so rigid, and she was able to bend both her knees with perfect ease, but could not direct her feet to any given point; when she attempted to walk, her feet always crossed each other: no cause could be assigned for this defect, but it was remarked, that her understanding did not seem to be so perfect as is usual with children of her age, was extremely irascible in her temper, and shewed every mark of great nervous irritability. It was evident that the defect was a deficiency in the connection of the mind with the powers which move the legs, (whatever the nature of that connection may be) and rigidity in the legs and feet in consequence of the irregular action, produced by that cause. Of the possibility of reducing the feet to their natural form and position, there could be no doubt, as well as of restoring completely their capacity for action; but as the cause which existed in the constitution, and produced these defects, was not understood, it was doubted whether the cure would be permanent; it was, however, determined to make the trial, and in the month of April following, she could walk as well as any other child of her age, her feet being perfectly reduced to their natural form; the proper instruments were used for some time afterwards, and then she was left to herself. I again saw her in the summer of 1805, and she had never had any return of her complaint.

CASE LVII.

Miss C. had her right foot more distorted than that which is represented in pl. 25, and was rigidly fixed in that position; her left foot was distorted in a similar manner, but not in the same degree, nor was it so rigid. I was told by her parents, that this defect did not make its appearance till she was fifteen months old, at which time she was first affected with very severe fits: at the time I saw her she was more than three years old, and appeared very much like an idiot; she spoke perfectly intelligible as to the words, but the matter was incoherent and irrational, she was impatient of contradiction, and when she was contradicted, flew into the most violent passion, screaming and using the foulest language she could employ; she could walk but very imperfectly upon her toes, and crossing her legs over each other when she attempted to move forward: she was first placed under my care in April 1801; in the December following, she was able to stand flat upon both her feet, and walk with tolerable freedom; she was provided with instruments to keep her feet in the state to which they were brought, and any farther professional attendance was thought unnecessary.

Either, due care was not taken to apply the instruments, or the disposition of the legs to contract themselves became more violent; for, in the March following I was desired to see her again, and found the legs were becoming contracted as they were when I first saw them; the same means were renewed, and with the same success. I was then requested to attend occasionally, to see they were kept in a proper state, which was done for some time; but the mother of my patient dying, I was prevented from attending her for some time, when they again relapsed.

A third time they were reduced to such a state that she could walk upon them, and I was requested to see her occasionally; but being removed into a situation in which I could not attend her, I have no means of knowing in what situation she continues, since I saw her last in April 1803.

CASE LVIII.

Master P. was born with his right foot distorted, a case of varus similar to that represented in pl. 1 of this Appendix: many attempts had been made to cure it, but
without

without success; in February 1800 he was placed under my care, being then four years old: nothing particular occurred in the treatment of **THIS** case, and in the month of June, his foot was well; he was removed from under my care, and *this* deformity never returned.

At the time he was under my care, he did not speak intelligibly, and did not stand so upright, or walk with so much ease, as even those children do who labour under this distortion of one foot; but this circumstance did not attract very particular attention, and the deficiency in his speech was only attributed to a peculiar backwardness in that particular, as it is well known that some children learn to speak much sooner than others.

In June 1804, I was again desired to see him; the original distortion of his right foot, which was a varus, the foot slightly turning inwards, had never returned, but that foot had now become distorted by contraction of the tendo Achillis and gastrocnemii muscles, so as nearly to resemble the right foot, which is represented in pl. 25, but more perfectly than in the following pl. 26: it was most rigidly fixed in that situation, the toes and every part seemed to be incapable of the least voluntary motion, and equally incapable of being moved by artificial means; its rigidity was so complete, that I could not move any part of the foot, so as to make the motion of any muscle or tendon of the toes visible under the skin: his left foot had assumed a similar deformity, but by no means equal to the right either in extent or rigidity. I was not permitted to take models of this child's feet, and therefore can only explain their situation by reference to the plates I have mentioned.

Other circumstances in the situation of this patient, now claimed peculiar attention; his speech was as imperfect as when I first saw him; those who were constantly about him could understand his meaning, but others could not, and there were some peculiarities in his understanding: he certainly *understood* the meaning of those who were with him, but was wayward and ungovernable by every one except his father, who could, with a few words, compel his attention to any thing he desired him to do, and his mother had the same power in a smaller degree; but every other person could only stand by to see that he did no mischief to himself or others, as they could not direct his attention to any subject whatever.

When his attention was engaged on other subjects, he moved his fingers, hands, legs, and every part except his

his feet, with perfect freedom; but when he walked, he was necessarily obliged to go upon his toes, and therefore bent his knees and body so as to preserve its equilibrium over his toes; he seemed to be under the influence of fear, and if his hand was taken to lead him along, all his joints became rigidly fixed in their position, and he drew back and resisted, as if afraid of being forced out of his own manner of walking.

Every circumstance clearly indicated that this disease was to be considered in a two-fold point of view; first, as a disease in the constitution, affecting the whole system in a peculiar manner; and, secondly, as a local affection, viz. permanent contraction of the feet, in consequence of the constitutional disease acting continually upon them.

Perhaps the real nature and true seat of this disease could not be understood; its immediate consequence was a derangement in the medium of connection, (whatever that may be) between the mind and all the flexor muscles of the arms and legs, which derangement induced an irregular action of those muscles, and its remote consequence would have been permanent contraction of them, continually increasing, till they would have been incapable of moving at all.

The constitutional disease it was not my business to consider; others were consulted upon it, but whether it was or was not removed, I felt the importance of removing the contraction which it had produced; though, if the constitutional disease was not removed, the relief could be but temporary; I was more forcibly impressed with this idea, because I knew the consequence of a similar disease, in a patient who came under my observation many years before I had discovered a method of curing contractions of this description.

About ten years ago, I saw the son of a gentleman in Ireland, whose general appearance resembled that of this patient, but his legs were more contracted; every thing that medical and surgical skill could suggest had been tried to relieve him, but in vain: I was asked if I could recommend any thing to relieve or assist him, but the subject was then new to me, and I did not venture to attempt it. Several years afterwards I inquired after the fate of this patient, and learned that he was still alive, but all his limbs were so contracted, that he was incapable of any voluntary motion, and in this miserable situation it seemed probable, that he would long exist. By the facts of that case I was convinced, of the importance that even partial and temporary relief must be of to this patient, and there-

fore I engaged in this case, and, by April 1805, had reduced both his feet to their natural form, and restored their capacity of performing their natural motions to their full extent, when carefully directed; but the irregular action still continued: when I could direct his attention to other objects, I could move both his feet or his legs, so as to give the full motion to those parts, as well as I could to any other person; but so soon as he perceived what I was doing, he seemed to be stricken with fear, and immediately contracted every muscle, so as to counteract all the efforts I made to move his feet.

While I was engaged upon this subject, a gentleman who is eminent for removing impediments in the speech, was employed to teach my patient, and succeeded so far as to make him speak, so as to be perfectly understood by any person whatever; the success of this gentleman confirmed my opinion, that there was no physical impossibility in the way to prevent him from getting the use of his legs; and as their form, capacity, and power of motion was regained, it remained to try, whether his attention could not be so directed as to give him a settled habit of using them in a particular manner, and keep that habit up till it became natural.

For this purpose I suggested to his father the propriety of teaching him to march, so as to bring all the muscles of the legs into action; and as that gentleman had considerable influence over him, he in a short time brought him to march so well, for a few minutes at a time, that an indifferent person would not have discovered that any thing was the matter with him; the length of time that he would do this was uncertain; sometimes five minutes, ten minutes, or a quarter of an hour; but he then resumed his former attitude, and no method could be used to make him march any longer.

Under these circumstances it was determined to apply such instruments as would forcibly confine his feet in their natural situation, and often take them off, and make him march as long as possible, and repeat this frequently, in hopes of permanently enabling him to use his feet in the natural way; this plan was persevered in for some time, with the best hopes of success; but in June he was afflicted with a malignant fever, which nearly destroyed him, and left him so reduced, that it became necessary to lay aside every thing, to attend to the restoration of his health, which is not so far re-established, as to allow attention being paid to his feet.

CASE

CASE LIX.

To the Editors of the Medical and Physical Journal.

GENTLEMEN,

In May 1800, J. Haythorne, Esq. of Bristol, consulted me about his daughter, of whom he gave the following account.

She had been healthy from her birth till about the age of two years, when she had a fever, and at the same time lost the use of all her limbs by (as it was supposed) a paralytic stroke. From this she recovered; but it was soon observed that the right foot was weaker than the other. As she grew, this defect continued to increase; the foot became weaker, and deformed to such a degree that at last she had no power to use it; at least, it had no capacity for voluntary motion: it became rigidly fixed in its deformed state, with much tendency to increase in deformity, in consequence of the very imperfect manner in which she was able to walk about. The left leg and foot began to assume the same appearances, though in a less degree; electricity, the Bath waters, &c. and every means that could be devised to obviate or diminish this defect, had been tried without effect, for it increased so much, that at last she could not walk across the room without being led by an assistant and supported by a stick; she began to grow distorted from the pelvis upwards; and as every circumstance of the disease was rapidly increasing, without any well-founded expectation of restoring the form and powers of the parts, application was made to me, to contrive some means of preventing her from getting worse, and, if possible, of enabling her to move about in the situation she then was.

At this time the right foot was, (as supposed) in consequence of permanent contraction of the tendo Achilles, so drawn downwards, that the ball of the great toe, the heel, and the calf of the leg, were in a direct line with each other; the foot, by the apparent contraction of the plantar aponeurosis, was much shortened, and rendered hollow on the bottom and the inside; the great toe was drawn up and permanently shortened; the circular head of the astragalus was out of its natural situation, and lay in a direct line with the front of the leg; the toes were turned inwards, so far, that when she attempted to stand or walk, she rested upon the nails of the three middle toes.

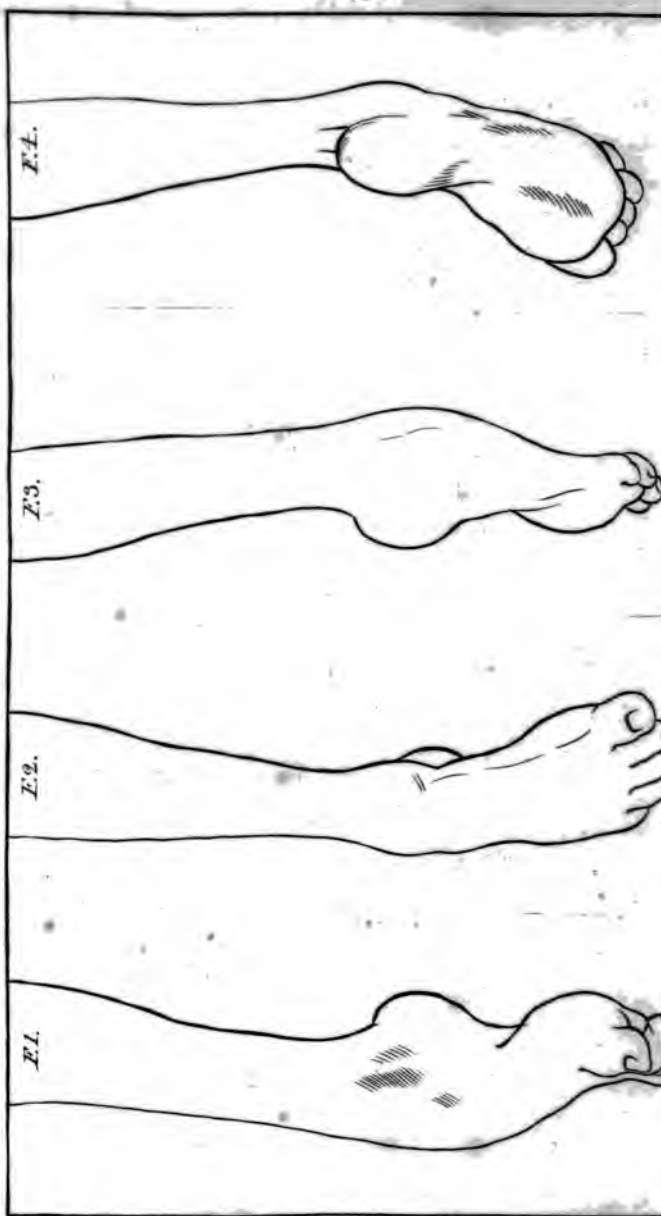
as the great toe did not touch the ground; in consequence of this state of the foot, every attempt she made to walk or stand upon it tended to increase the deformity; the leg was flaccid, much wasted, and she was not conscious of any degree of sensibility either in that or the foot. At this time I had a cast in plaster of Paris made from the foot, in presence of Mr. H. who observed, that the workman placed the foot as near to the natural position as it was possible to be in when he made the mould; from this cast I made four views, in different directions, which are in the annexed pl. 26; and will give a correct idea of the state of the foot at the time.

The left foot had made so much progress towards the same state, that, in any other patient, it would have excited considerable alarm; but in this was scarcely considered, or at most only as secondary in point of consequence to the other. Both the knees bent inwards, and the distortion that was beginning to take place above the pelvis, had as yet produced no permanent deformity; and as it was merely the effect of peculiar positions, occasioned by the deranged action of the legs, it was at this time not an object of attention.

Mr. H. when he applied to me, had no expectation of obtaining more than the palliative relief; but, in consequence of my opinion, was induced to place her under my care, to see what could be effected towards obtaining a cure. Before the end of the first week that she was under my care, she felt a warm sensation pervade the whole of her right leg, which till then had not evinced the least sensibility; and this sensation became so permanent, that much attention was requisite, during the progress of the cure, to prevent it from becoming excessive; the form of the foot soon underwent a material change, and continued to do so progressively till last December, when she was able to stand flat on the sole of her foot; and while standing upon it, there was little in its appearance to distinguish it from the foot of any other person.

At this time I had a second cast made from the foot, and from this cast I have made the four views represented in the annexed pl. 27, viz. fig. 1, a profile view of the inside of the leg and foot; fig. 2, a front view of the same; fig. 3, a profile view of the outside of the leg and foot; and fig. 4, a back view of the same. In making the drawings represented in pl. 26, I placed the LEG in the same situations as the leg in pl. 27, consequently, by comparing the feet in each plate with those marked with corresponding numbers





numbers in the other, a correct opinion may be formed of the alteration produced in the form and appearance of the foot at the different periods when the casts were taken.

A circumstance at least as remarkable as the alteration in point of form, is the increase of size in the whole limb that has taken place during the time, that has been employed in the cure; partly by the alteration in point of form, which is the consequence of reducing the foot to its natural state, but more by the absolute increase of size in the whole limb during the progress of the cure. To show what this has been, I subjoin an accurate measurement of the two casts, and have marked with a dotted line on fig. 1, pl. 27, the direction in which these measures were taken, viz.

	Distorted Foot. Restored Foot	
	Inches.	Inches.
Length of the foot - -	6 $\frac{1}{2}$	7 $\frac{1}{2}$
Breadth of the foot at the toes	3	3 $\frac{1}{2}$
Circumference at the toes -	7 $\frac{1}{2}$	8 $\frac{1}{2}$
Over the instep and round the heel - - - -	9	10 $\frac{1}{2}$
Smallest part of the leg -	5 $\frac{1}{2}$	6 $\frac{1}{2}$
Largest part of the leg -	8 $\frac{1}{2}$	9 $\frac{1}{2}$

Extraordinary as these circumstances may seem, as the models were taken in the presence of Mr. H. and other persons equally respectable, and as they are still in my possession, it will always be easy to prove that these circumstances are incontrovertible facts. As the reduction of the foot to this state is the most striking part of this case, it was my intention to send the history of it at this period; but as other avocations have prevented me from doing so, I have an opportunity now to add, that though so much alteration in point of form cannot take place since the period when the last model was taken as did before that time, yet minuter alterations have taken place so fast, that I am now warranted in saying, this foot will be perfectly restored to its natural form, and that no one circumstance will remain to show that it has been distorted. I might perhaps be justified in saying as much of the restoration of its natural powers; but as I would avoid the imputation of rashly advancing too much, I shall content myself with stating the fact, that she has lately been able to walk three miles without inconvenience; and when it is remembered, that ten months ago she could not go so many yards without assistance, and as she is mending rapidly

pidly every day, I shall leave every one to form his own conclusions on the subject.

I have said nothing of the left foot ; for, although, if it had been the only one diseased, it would have been an object of importance, it was but very little distorted in comparison with the other, and it is now sufficient to observe it is equally recovered ; the tendency to a distorted spine too, in consequence of the alteration in the legs, has disappeared without requiring any assistance, though if the distortion of the legs and feet had continued, it is certain that very serious incurvation of the spine would have taken place.

As I wish to avoid every imputation of exaggerating any circumstance of this case, it is necessary to add, that I transmitted the above Narrative to Bristol, and have received the following letter from Mr. H. in reply.

“ To Mr. SHELDRAKE, No. 50, Strand.

“ Dear Sir,

“ I have forwarded by the mail coach of this day, your Narrative of my daughter's case, which I have perused with the most affectionate interest, and confirm in its fullest extent, heartily wishing its publication may excite general attention to your important and invaluable discovery. I congratulate you and myself that this case, so happily treated hitherto, and promising complete success in the event, will establish your claim to the approbation and applause of all mankind. I am extremely concerned that this wonderful case cannot be farther confirmed by the testimony of that worthy gentleman* who was the cause of my placing the child under your care ; his professional character, no doubt, would have had great weight ; he had seen the first and second models, and, on that proof of advantage gained, encouraged me to hope the cure would be complete ; had he lived to have seen the last, I am convinced he would have been happy to have had this opportunity of offering this public acknowledgment of your merit, in conjunction with,

“ Dear Sir,

“ Your obedient friend and servant,

“ JOHN HAYTHORNE.

“ Bristol, 14th April, 1801.

“ P. S.

* The late Mr. Townsend, surgeon, of Bristol, who is recently deceased.

"P. S. I beg you will refer any person desirous of seeing the models in this part of the kingdom to me; and, in case another is taken for yourself, that I may have one also."

If the above case was an anomalous one, in which the effect of some lucky experiment had proved beneficial to the patient, I might now take leave of it with those sensations that naturally will arise from the consciousness of having been serviceable to others; for, as no situation can be more powerfully contrasted than that of this patient, ten months ago, when she was almost helpless, and had no other prospect than that of increasing debility and its consequences, with that in which she is at present, almost restored to the full use of her powers, with life and all its prospects opening before her; so the reflection of having produced the alteration would be sufficiently gratifying: but as this is one very strong example of a very numerous class of diseases, few cases of which have been radically or even palliatively cured, and as the success in this case was the consequence of an accurate investigation of the alteration produced in the parts by whatever caused the disease, and a minute and laborious application of the means requisite to restore those parts to their natural state, and as the same principles, if skilfully adapted and sedulously applied to the many varieties of the same disease, will, in all probability, prove equally successful as it has done in this, I trust I shall be excused for adding a few observations on the subject.

We continually hear of what are called contractions of the limbs, arising, in all probability, from many different causes; connected, it is equally probable, with very different states of the parts: yet the opinions of professional men are not so far settled as to point out any general system upon which they may be treated with a probability of success; while the empiric, who perhaps has known some benefit produced by some remedy in one case, boldly applies the same remedy in all cases that he is pleased to call by the same name, and thus goes on, promising much good, and doing no little mischief, till he is at last sunk in oblivion. It is in order to rescue the subject from this state of confusion that these observations are written; and I therefore hope, if they should not be successful, the attempt will be excused, and some more fortunate, and more able hand will be prompted to do justice to the subject.

What is a contracted limb? To some this question
 P may

may seem unnecessary ; but as I wish to define, accurately, the data upon which I mean to argue, I shall be excused for observing, that by the term contracted limb, I understand *only* that which, by the spasmodic action of one or more muscles, or by the loss of substance or alteration in the natural texture of some muscles or tendons, is drawn into and firmly fixed in an unnatural position. Of this class of diseases, the cramp and its consequences may be mentioned as causes much in point.

When, in consequence of exercise unusually violent, and continued for an uncommon length of time, the legs become fatigued, and the patient lies down to rest without properly guarding himself from the effects of cold, the gastrocnemii muscles suddenly and violently contract themselves, and forcibly draw the feet into a peculiar position, in which they become fixed, and this is attended with excruciating pain to the sufferer, which is much increased by any forcible attempts to restore them to their natural position. It is easy to see, that if this effect was permitted to continue for a long time, the motion of the feet must cease ; the pain in the contracted parts would diminish as they become accustomed to their situation, and, at last, would totally cease, except when any attempts were made to force them into action. It is likewise easy to see, that if this effect was continued for a longer time, such an alteration might take place in the organization of the contracted muscles or tendons, as would constitute an irremediable disease. The rational mode of curing this class of diseases in their early stages, and attempting to cure them in their more advanced ones, would be the use of the warm bath and such applications as can relax the parts, and mechanical applications or efforts to bring those parts into action, in proportion as they become relaxed ; but it is extremely probable, that if a positive alteration had taken place in the structure of the contracted parts, that this system of treatment would produce no benefit whatever ; that if incautiously practised, it would produce much pain ; and if by misfounded fortitude in the patient, or imprudent perseverance in the operator, it was continued to excess, great inflammation in the parts might take place, and very serious consequences might ensue, without the possibility of obtaining any advantage to compensate the risk.

Of the success of this mode of treatment, when it is successful, it cannot be supposed that I should know much, for it is not connected with my practice, and patients

tients who have been relieved by it, need to seek no farther assistance; of its failure in those cases in which I have said it is very unlikely, if not absolutely impossible, that such treatment should succeed, I have much information; and I must add to this, that I have no knowledge of any means by which such contractions as are occasioned by alteration in the structure of contracted parts can be cured. Of this class I shall briefly mention two cases out of the many that have fallen under my observation.

A gentleman in India went to sleep very imprudently in an exposed situation; he waked in excruciating pain from the cramp; the flexor muscles of the thigh and leg were so contracted, as to bend the leg into the position it usually is when we sit down, and in this position it was permanently fixed. All attempts to remove the contraction were ineffectual; he returned to England, and sought for assistance here without success, and, at last, applied to me. As every thing that could be done under the idea of relaxing, &c. had been tried, and as it appeared to me to be a case of permanent, incurable contraction, I was not willing to make any attempt, but advised that he should try, by means of an assistant, whether the parts could be brought to act in any manner; these attempts, however, were attended with such excruciating pain, that they were soon discontinued, and the patient remains in the same state as when I saw him first.

In the year 1795, I was called to the son of a gentleman in Ireland; there was a general tendency to contraction in all the flexor muscles of the thighs, legs, and feet; when he lay down, his knees were drawn upwards, and his toes pointed straight forwards; when he attempted to walk, it was only by holding a table, or the chairs, and upon his toes, with his knees bent. The warm and vapour baths, electricity, fomentations, and relaxing applications had long been tried, it was said, with good effect, and I was asked to contrive such instruments as would extend and keep the limbs extended in proportion as the applications that were used would enable the parts to bear extension. I did so, and the plan was followed with much perseverance, and for a great length of time; but at last all the remedies were thrown aside, as no benefit was derived from them; and if the patient be still living, I conclude he is in the same condition as when I first saw him.

By these, and many other cases that have fallen under my observation, I am authorised to say, that although the use of relaxing applications may cure some cases of contraction

traction (adhering to the definition I have given of the term) yet, in general, they are ineffectual, and a successful method of curing those diseases is still a desideratum in surgery.

To those limbs which, like that of Miss H., are fixed in one position, and which are not distorted by contraction, in the sense I have used that word, I would apply the term rigid, as indicating their condition, without specifying the cause of it; distorted limbs of this kind may be occasioned by many different causes; among the most frequent of which, are the following, viz. Luxation of joints, &c. which by weakening the connecting ligaments and particular muscles, alter the position, and derange the natural action of the limb, and thus throw it into an improper situation, in which, at last, for want of proper action, it becomes permanently fixed. In consequence of palsy, when, upon the removal of that disease, due care is not taken to place the limb in that situation which is most favourable to enable it to regain its natural powers; and many others, which as their effects are exactly the same, it is needless to particularise here.

The capacity for muscular motion, in any limb, depends upon the exact proportion of the power of the flexor and extensor muscles to each other, by which means it is enabled to perform its functions with propriety; of course, by whatever means the powers of those two sets of muscles are rendered unequal, derangement of its action, and deformity in its shape, must be the consequence; that inequality, once established, will continue to increase till the action of one set is destroyed, and that of the other will cease of course; the limb will be motionless, lose its flexibility, and diminish in size, its sensibility will become latent, and, at length, the whole limb be reduced as near to a lifeless state as a part of the living animal can be. Such was the condition of Miss H.'s foot; such is the condition of many limbs called *contracted*, which are improperly treated, and finally abandoned in despair; when, by a different mode of treatment, they might be restored to their pristine vigour.

As this is a point of much importance, I shall perhaps be excused for proceeding a little farther upon it. If this disease is called contraction, and it is treated with what are called emollient or relaxing applications, what will be the consequence? The original cause of the disease is debility in particular muscles; and it certainly is not easy to conceive, how the application of relaxing remedies to parts

parts which have lost their power of acting from mere debility, can restore those parts to their natural state; it is easy to understand that the application of these remedies must be, at best, useless, when administered in every possible form, if they did not accelerate the progress of the disease; thus, by calling that disease contraction, which, in fact, was debility, a method of treatment was adopted which was not adapted to the nature of the disease; and when it is considered how many similar cases there are which are treated upon the same principles, and with precisely the same result, this attempt to place the subject in its proper point of view may not be found unnecessary to future success.

The leading principle upon which I acted in this case, and which, I believe, will prove successful, if skilfully applied, in every other that is not in its nature incurable, was to restore the powers of those parts which had lost them as the distortion came on, from a persuasion that, if this could be done, the form and action of the whole limb would be restored of course. I am aware that this has been attempted by electricity and other means, though not with success, I therefore merely mention the circumstance, as it might seem invidious to enquire minutely into the causes of failure when those means have been employed.

I had learned, in the school of Mr. Hunter, that muscular motion, artificially excited, would in time produce or restore muscular power; to the discovery of the principle on which these diseases should be treated, then, I have no claim; but the merit I am entitled to, if it deserves the name, is that of having contrived the means of reducing this principle to practice, in the cure of a very numerous class of diseases, and to any degree that may be required.

This case of Miss H. has been called paralytic; if it was so, then is this method to be called a cure for palsy; but there is abundant reason to believe, that if palsy was the primary cause of this debility, and its consequent distortion, *that* palsy had long been removed, and all the effects I saw were merely the effects of debility; it is not a little singular, that the sensibility of which this leg had been so long and so completely deprived, as to give rise to a notion that it laboured under the influence of palsy, should be so completely restored in a few days, that much attention was requisite during the progress of the cure to prevent its becoming excessive; the increase of size too,

too, notwithstanding the constant application of the bandages, &c. necessary to effect the cure is so very remarkable, that it requires every voucher of its authenticity to be carefully examined before implicit credit will be given to the account of it.

If any should object that I go too far in arguing, from the cure of this case, that every other case of the same description may as certainly be cured, I shall beg leave to observe, that the greatest, certainly includes all the less, and many cases of the same kind, but less in degree, I have had under my care, succeeding equally with them all; I believe too, it is fair induction to say, that if there are worse cases of the same kind, it is very probable, nay, almost certain, that the same means, if duly proportioned, and sedulously applied, will certainly cure every case, however bad it may be, till it arrives at that point which opposes some physical impossibility to prevent our success.

At what period that impossibility may take place, it is not easy to say, though it certainly does not take place so early as it has been supposed; and, it is extremely probable, it will be much later in life, and much less frequently, than many will imagine. As it is of consequence that this doctrine should be firmly established, I shall perhaps be excused for supporting it, by referring to a quarter from whence information on this subject might not be expected.

A late author,* in describing the extraordinary mortification of a devotee, says, "The complete term of his first penance being expired, the next he undertook was to hold his hands, locked in each other, over his head, the fingers of one hand dividing those of the other, for the same space of twelve years.—When I first saw him at this place, in the year 1783, he rode on a piebald Tangun horse from Bootan, and wore a satin embroidered dress; given to him by Teshoo Lama, of which he was not a little vain. He was robust and hale, and his complexion, contrasted with a long bushy black beard, appeared really florid. I do not suppose that he was then forty years of age. Two Goseins attended him, and assisted him in mounting and alighting from his horse; indeed, he was indebted to them for the assistance of their hands on every occasion; his own, being fixed and immovable, in the position in which he had fixed them, were, of course, perfectly useless.

" *The*

* Turner's Embassy to the court of the Teshoo Lama.

" *The circulation of the blood seemed to have forsaken his arms ; they were withered, void of sensation, and inflexible ; yet he spoke to me with confidence of recovering the use of them, and mentioned his intention to take them down the following year, when the term of his penance would expire.*

" Other Goseins assured me, *though I could not help doubting the fact*, that it is practicable to restore withered limbs, thus circumstanced, to perfect use. This is effected, they say, though not without great labour and some pain, by means of long continued friction, before a large fire, with a certain ointment which they compound."

The authority of these Goseins is not to be very highly estimated as to the surgical treatment of the disease, though they may safely be admitted as evidences to the fact mentioned by Capt. Turner. The appearance of the man so crippled is not mentioned as unique ; it is stated, and indeed known, to be the regular practice of a certain description of persons who profess the same religion ; and though it is a species of superstition, it is not of that gloomy kind which has led many to destruction, but, with the calmness of mistaken philosophy, that man willingly rendered his arms useless for twelve years, from a belief, that the sacrifice will be grateful to his Deity, and a conviction that at the expiration of the time mentioned in his vow, he *can take them down again, and recover the perfect use of them.* His countrymen likewise believe this, and state the means by which it may be done, not as a matter of doubt, but as of the most absolute certainty, and, undoubtedly, not without sufficient reason.

There are no practices more antient than the superstitions of India ; they have been invariably followed, without the least deviation, for a series of ages, of which, perhaps, we have no adequate idea ; and it results from our knowledge of the facts mentioned by Capt. Turner, that persons at the present time do what has been regularly done by their countrymen for time immemorial, viz. render their arms useless for the term of twelve years, and at the end of that term restore them to their original perfect state. Capt. T. doubted the fact, because he had no knowledge of any thing similar, yet, the terms in which he describes the man's *arms*, if the word *leg* was substituted for it, would be very descriptive of Miss H.'s leg ; the cure of this is within our knowledge, and justifies us in believing what is related of this man by Capt. T. which again

again will justify us in concluding, that many persons with the same kind of defects, and much farther advanced than that of Miss H. is, may be perfectly cured by the same means that were employed in curing her.

Mr. H., in his letter, calls this a wonderful case; others, who are not equally affected by it, may call it an extraordinary one. As I do not wish for the reputation of working miracles, and am desirous to subject what seems to be extraordinary to the judgement of those who are competent to decide upon it, I shall state what appears to me to be the progress of a limb in the condition this lady's was, from the healthy to the diseased state, and on its return to the healthy state again.

In consequence of weakness, from whatever cause, the extensor muscles of the foot were incapable of performing their functions properly; the contractile action of the flexors was of course increased, and the foot thus drawn into an unnatural position; this derangement, deformity, and rigidity, increased till she had no power to use the leg, in this state it diminished in size for want of action, and lost its sensibility from the same cause. In this state it was called a *contracted leg and foot*, and every application made to it, instead of curing, only increased its debility, and, at length, it became useless.

Having formed a different opinion of it, I avoided all the farrago of emollients, &c. as I would have done the ointment of the Goseins, and confined my treatment to the application of bandages, consisting of springs so adapted as to imitate the action of every muscle whose power was deficient, and by altering, adapting, and modifying these applications, so as to produce the action of every muscle in its turn, I proceeded by degrees, till the foot was reduced to its natural form, and so much of its natural powers restored, as leaves a well-founded hope, that every the least appearance of disease will be exterminated.

The physical alteration in the state of the parts seems to have taken place in the following manner: By applying a spring to draw the foot towards the same position in which it would be placed by the action of any particular muscle, that muscle is brought to act though it had not before the power to do so; and, in consequence of this action, the general circulation is increased through the whole limb; the consequence of this increased circulation is enlargement of the vessels through which the fluids circulate, and of course an increase of size and sensibility in the whole limb. The application to produce the action of every
muscle

muscle must be changed and varied according to the feelings of the patient; but, however it may be necessary to vary these applications, the general action of the limb is perpetually kept up, and, if duly regulated, the restoration of feeling, size, shape, and, finally, the natural power of action, is completely and permanently restored.

I am, &c.

T. SHELDRAKE.

Strand, April 20, 1801.

*To the Editors of the London Medical Journal.**

GENTLEMEN,

I think it was proposed at the beginning of your publication, that when any correspondent made a communication

* The above case is printed verbatim, as it was inserted in the fifth volume of the Medical Journal, for May 1801. The sequel is printed verbatim from the manuscript which was sent to the Editor of the same Journal for insertion, in December 1804, and rejected. I am aware that, as they are now to become a part of my own work, they might have been compressed into a less compass; but, as I mean to call upon the Editor of that Journal to account for his conduct, it was indispensably necessary to shew the papers in the exact state they were put into his hands.

Differences between authors and journalists have existed as long as those two races of men: but, though my writings have frequently fallen into the hands of Reviewers, sometimes obtaining approbation, and sometimes censured, I have never had occasion to question the integrity, the candour, the liberality, of any Reviewer or Journalist, till that transaction of which I am now to speak.

It was formerly said, that Reviewers or Journalists, who are anonymous, may take liberties with authors, which they could not do if their names were known, because if they were known, they would be personally responsible for their conduct; the assertion was plausible, but I know nothing of its truth. It is certain, however, that of late years, gentlemen who have established such publications, have put their names upon the title pages, thus affording a presumptive proof that they would act with propriety, in discharging the duty they had voluntarily taken upon themselves; or, at least, indicating where redress might be sought by any one by whom injury should be sustained. This would be an idle ceremony, if no use was to be made of the information when occasion made it necessary: it certainly is an act of justifiable necessity for me to ask for *public explanation on the present occasion*, and, that no innocent gentleman may be blamed in consequence of what I may write, I think it necessary to say, that there are two Editors to the Medical Journal, viz. Dr. Batty

and

tion that was, at the time, imperfect, he should send the sequel, at a future period, when it could be rendered complete.

and Dr. Bradley. I know Dr. Batty, and have found that, in every transaction, he has shewn the candour and urbanity of a gentleman, and the principles of a man of honour: I know Dr. Bradley too, and know that he is exactly what I shall prove him to be That no mistake may be made, I think it necessary to say, that every communication, personal or in writing, that I have had with the Editor of the Medical Journal, has been with *Dr. Bradley alone*—I therefore shall speak of Dr. Bradley only, or, if I should ever use the words *Editor of the Medical Journal*, it will be because I find it so written in the book; and then, I do not insinuate ~~who~~ the person is that is described by those words, though I may be able to give a shrewd guess on the subject.

In 1800, a person published in the Medical Journal what he was pleased to call *A New Discovery of a Cure for Distortions of the Legs and Feet of Children*, but which was, in fact, a farrago of plagiarism from what was previously well known on the subject. By exposing this in its proper point of view, I fell into a dispute with the author of it, which was conducted with angry scurrility on his side, and cool, but perhaps severe castigation on mine. At the same time, I proposed to communicate to the same Journal a series of important cases on the same subject, taking care to keep the two communications distinct from each other.

After the publication of the first (*Case XXXIII of this work*) *Dr. Bradley* called upon me: he said, "many friends disapproved of the dispute that was going on in the Journal, and advised him to stop it; that the case I had published was so important, and so well authenticated, that it did me more honour than I could derive from the victory in such disputation, and therefore requested that I would continue my own communication, and drop the dispute." This I promised to do, and the next month sent the *Case XXXII of this work*, to which I added the following postscript.

"Permit me to say, I shall send no answer to your correspondent Mr ——— for he has descended from discussing the subject in dispute to personal abuse, and is, *therefore*, fallen too low for me to notice."

This was a true and sufficient reason for me to abandon the dispute, and would have authorised me to do so, had I not done it at Dr. B.'s particular request; *the last was my real motive*; and as it was confidentially settled by Dr. B. and myself, if he had possessed the feelings of a gentleman, he would, by his authority as an editor, have declined publishing any thing more of controversy between us, after I had publicly assigned a true and sufficient reason for not replying to the last writing of my opponent. Judge then of my astonishment, at finding, in the next month's Journal, a letter from my old opponent, in which he claims victory for himself, and sneers at me, because "it is certainly the most rational mode of procedure, when he finds his attack no

"longer

complete. A wise regulation! As we may often be led, by the ardour of an *apparently* successful experiment, to form

Q 2

"longer defensible, to get rid of it in the best way he can." As the fear of being vanquished never entered my mind, and as Dr. B. had, in a very ungentleman-like manner, permitted this sneer to be published against me, *after what had confidentially passed between us*, I sat down to expose the proofs of the scurrilous baseness of my opponent, and sent it to the Journal, with the following introductory letter:

To the Editors of the Medical and Physical Journal.

GENTLEMEN,

In declaring my resolution, through the medium of your Journal, not to answer your correspondent, Mr. ———, I was actuated by motives of respect towards yourselves, and decorum to your readers; as, I conceive, your object is to promulgate the knowledge of truth, and theirs to acquire useful information, neither of which can be promoted by the continuance of a dispute, which, by the conduct of my opponent, has degenerated into *personal abuse*: so thinking, and acting from such motives, it is not without surprise that I perceive you have printed in your Journal for the present month, a letter from him, in which I am charged with having declined the controversy, because I *find my attack no longer defensible, and therefore got rid of it in the best way I can*; and likewise, am loaded with some more of that kind of personality which has already placed him beneath my farther notice. It is not for me to question your motives for inserting his letter, as I have no doubt, that that justice which regulates your conduct, will induce you to publish this answer, which *that letter has rendered necessary*.

It concluded with the following:

I shall take leave of Mr. ———, unless you should indulge him by publishing more of his personal reflections on myself: it is to repel *such reflections only*, that I have written this; and trust, that you will see the propriety of putting an end to *such* disputes. But whatever may be advanced on professional subjects ought to be liable to accurate investigation, which I shall never wish to avoid, and which, I hope, will continue to be the chief object of your valuable Journal.

It will be perceived, that these passages merely re-echo those reasons which Dr. B. *urged, to induce me to put an end to the controversy*. To my utter astonishment, in the next Journal, was inserted another letter from my old antagonist, which was worthy of his former production, and contained the following note:

"When Mr. S. made this peroration, he seems to have foreseen clearly, & and dreaded the consequences of his last communication; he therefore, in
"orders

form hopes which the event does not realise, and, if the event is not made known, thus unintentionally mislead or deceive.

In

"order to get off with the victory, makes this singular request to the Editors, "that they publish *nothing more from his opponent.*"

The gentleman-like propriety, the strict impartiality of Dr. Bradley, in printing the slander of this man, who attributed my determination to decline the controversy, to motives which Dr. B. knew to be false, because *he knew that I declined the controversy at his own particular request*, require no comment; they convinced me that Dr. B. and his protégé were equally contemptible, and that I should disgrace myself by taking farther notice of either. I did not notice the writer again, and, as it happened, the history of Miss H.'s case was inserted in the same number of the Journal; as it had cost me much trouble to prepare this and my former communications to the Journal, I determined not to waste more of my time in furnishing matter for a publication, the Editor of which had treated me in so ungentleman-like a manner; I did not choose to ask an explanation of, or express resentment at this conduct, but, from that moment ceased to communicate any thing to the Journal.

When the Journal was first published, it was proposed, that when any person communicated the account of a case which was incomplete, it was expected that the author should hold himself bound to communicate the sequel, when it could be completed: the propriety of such a condition is obvious; in this situation, I stood bound to the readers of the Journal, and therefore (having never vented a word of complaint, in any manner, at the unhandsome treatment I received), sent the remaining part of the history of that case to Dr. Bradley, in the very words in which it is now printed. In a short time, Dr. Bradley left the manuscript at my house, with a verbal message, that "Mr. Sheldrake would know who it came from."

When professional men write what they intend for publication, upon the subject of their pursuits, they do not write what they are ashamed to have seen; but there is a kind of decency which should be observed in every transaction, which Dr. Bradley chose to violate in every particular of this. The manuscript was sent to him sealed up, he returned it open, exposed to the examination of every servant through whose hands it might have passed; as it consisted of loose sheets, some of them might have been lost, and, if they had been lost, he would certainly have been blamed. In fact, impressions of the plates which had been sent for his inspection, were missing; I wrote to reclaim them, and he then left them at my house, in the same open manner, with a pert message, that *Dr. Bradley did not think them of any consequence or he would have returned them before*. I admit the insignificance of the prints, and beg leave to say, that in proportion to the *worthlessness of the object was his meanness* in attempting to withhold it from me.

I shall now request the reader to examine whether there is any thing in
the

In the fifth volume of your Journal, p. 456, you inserted the history of a case of extreme distortion of the foot

the sequel of my paper that renders it unfit to appear, wherever the former part had been inserted; if there is not, he will determine on the propriety of Dr. Bradley's conduct in rejecting it, when it was sent *only in consequence of the rule that had been made in the Prospectus of the Journal*, "that the sequel of any unfinished case should be sent whenever the history of it could be completed." If the paper itself does not afford any reason to justify the rejection of it, such behaviour can only be accounted for by some exertion of personal enmity, and I shall now give the reasons which induce me to believe that Dr. Bradley was influenced by some such motives.

In the Journal for February 1803, was inserted a paper by an anonymous hand, containing "Some Considerations to shew that the Idea of effecting "a radical Cure of the Buboncele ought not to be entirely abandoned." Upon this subject I then thought, and am now convinced, that there is but one opinion among well-informed professional men: the object of that paper seemed to be to promote the revival of an operation which has formerly been much practised, but had been completely abandoned during half a century at least.

It has been my practice, during the whole of my professional life, to collect every kind of information that was connected with the subjects of my pursuits, whether it might be directly or collaterally useful if adopted, or injurious in itself, and therefore proper to be known, *in order to be avoided*; I have always had a sort of connection with patients who are afflicted with hernia; there is no disease that has been more subject to the malpractices of quacks and impostors, and I had always endeavoured to obtain a knowledge of the practices of those people, in order to caution the unwary against them. In this way I had ascertained, that several years ago a man, who was educated as a surgeon, frequently performed this very operation, under the pretence of effecting the radical cure, but finally abandoned it, in consequence of the clamour that was excited, from a knowledge of the mischief he had done. Upon this fact, and by investigating the structure of the parts that are concerned in the disease, I composed some observations upon the proposed operation, and sent them to Dr. Bradley, to be inserted in the Journal.

A few days afterwards I met Dr. Bradley in the street; he praised the paper, but said, he perceived it was not in favour of the proposed operation; that he wished to give time for the publication of such opinions as might be *favourable* to it, and therefore should defer the publication of my paper for the present, and, *in the mean time I might take it back again, if I pleased, to correct it*. In truth, after I had sent him the paper, and before the time of this meeting, I had received information, which convinced me that he would *never print it AT ALL*: in this he was to use his pleasure, but I determined not to assist his scheme, by *asking for the paper back upon any pretence whatever*: I therefore told him, that he was to print or return my manuscript, according to his own judgment, but, as I was convinced of the accuracy of

foot of Miss Haythorne, of Bristol, which had then been so far relieved, as to afford strong hopes that she would be completely

of every point that I had written, *I would not ask for it back again to correct it.* We then parted.

In the Notes to Correspondents for March, appeared the following :

" The Editors request the author of the Proposal for a radical Cure of Buboncele, signed S. C. and printed in our last number, &c. to transmit his name, otherwise they shall be under the necessity of giving the *priority of* THAT proposal to Mr. Carlisle, who publicly signified his intention to perform such an operation at the Weekly Consultation of the Westminster Hospital, seven weeks before the receipt of S. C.'s letter.

" We have received observations on that proposal ; but as it is not yet in an authentic form before the public, we have postponed their appearance for the present."

The author of the original communication gave his name, in obedience to the above requisition ; another month elapsed without any person taking up the pen in *favour of the proposed operation*, and, at the end of April, appeared the following Notice to Correspondents :

" We have again postponed the observations on the Proposal for the radical Cure of Buboncele, principally because,

" 1st. The chief object of our Journal is to *encourage and disseminate* all improvements connected with medical science ; but these observations are calculated, and apparently designed, to *discourage the proposed operation*.

" 2dly. We wish to give experienced surgeons more time to consider of the Proposal, in the state in which it is laid before them."

There is some fatality attends those who endeavour to do what they dare not openly avow, and leads them to do something which exposes the baseness of their own pursuits. Is Dr. Bradley so young as to have yet to learn that the most effectual way of promoting the success of any useful or laudable undertaking, is to allow full scope to the attempts of ignorance or malevolence in opposition to it ? And that, if it can be shewn, that such attempts are made by any who have some paltry interest to serve, by preventing the improvement from being adopted, will not the public exposition of such baseness properly punish its author, and serve those he may attempt to injure ?

All the coaxing and wheedling of this Editor for several months, could not induce any " experienced surgeon," good, bad, or indifferent, to *forfeit* his reputation, by writing in favour of the proposed operation, which establishes its value as effectually as could be wished ; the declared intention of this sapient Editor to *encourage* this improvement, by preventing any person to prove its inefficacy, not to say its pernicious tendency, is quite worthy of his wisdom and impartiality ; and, if he made it his rule of conduct, would amount to this : If any unexperienced young man should propose to revive the

completely cured : as she is now removed from my care to the tuition of her dancing master, I might say, in a few words,

the operation of amputating by the gripe, or any other *equally effectual* practice of the old surgeons, and insert his proposal in this *very valuable Medical Journal*, its Editor would do his utmost to *encourage and disseminate* the proposed improvement, and effectually oppose the propagation of reason or common sense, by suppressing all those arguments in opposition to *his favourite measure*, which might be brought forward by any persons who were inclined to shew what would be the mischievous consequences of adopting it. The just value of a Journal, conducted upon such principles, may be easily understood.

This Editor was still mortified by a death-like silence ! Not an advocate appeared with a single word in favour of this *important, highly-favoured operation* ; this seems to have thrown him into a violent passion against the terrible observations, as if, notwithstanding all his care to keep them in his own custody, and not let the subject matter of them escape farther than into the hands of his own confidential advisers, they had, like the torpedo, benumbed the hands of all his correspondents, and extended their baneful influence in every direction ; he endeavoured to counteract their pernicious effects, by proceeding as follows :

1st. " Our readers may perhaps be desirous of knowing on *what grounds* " it is discouraged in the observations above-mentioned, *and we see no objection to the stating of them.*

2d. " It is said, that the structure of the parts is such, that the complaint " will return, or the cure be only temporary. This is but an opinion, and the " opinion of the *PROPOSERS* is in direct opposition to it.

3d. " It is also said, that the operation was many times performed by a " Mr. Lee, and never with success ; but this Mr. Lee is represented by the " writer, as a character of little respectability or professional reputation, and " therefore no inference can be drawn from his want of success."

To the former part of No. 1, I reply, if his readers had any curiosity on the subject, it would not be to know, *on what grounds it was discouraged* ; but they would desire to know, *WHAT THE GROUNDS WERE upon which it was discouraged* ; and the only way in which he could gratify that curiosity would have been by printing the observations ; the matter would have then been before his readers, and they would have judged for themselves. But, this I am now in a condition to say, he did not *dare* to do, because the printing of those observations would have been fatal to the scheme he had in view, and which has, notwithstanding all his exertions, been as effectually destroyed as if he had not done one ungentlemanly act to promote it. To the part, "*we see no objection to the stating of them ;*" I beg leave to say, it is with regret that I, who am so inferior in years, and in wisdom, to Dr. Bradley, who is growing old in the profession of instructing youth, should find it necessary to inform him *what the duty of Editor to the Journal is* ; a duty which he ought to have understood, when he voluntarily took it upon himself.

The manuscript observations were sent to him for the *express purpose* of printing

words, that the cure is complete ; but think it will be more satisfactory to your readers, if I enter more fully into the particulars of the case.

A6

printing them in the Journal, or, the *implied* one of returning them to the author: he had a right to take either side of this alternative: but as the communication was confidential, for a *specific purpose*, if he did not choose to make *THAT* use of them for which they were entrusted in his hands, *he had no right to use them at all*; if he had used them in any other manner than that for which they were entrusted to him, *without misrepresenting them*, he would have been guilty of an ungentlemanly breach of confidence; but he has misrepresented them, by falsely saying, they contained what they did not contain; declined making them public, and kept the manuscript in his own hands, by which means he withholds the evidence that would convict him of falsehood. I shall leave others to give a name to his conduct, but I now call on him, before the public, either to print the observations, to prove whether what I now say is true, or to return the manuscript to me, that I may make my own use of it.

To the second, I answer, that the original communication to the Journal contained an *opinion of its author's*, with such reasonings as he chose to adduce in support of it: the observations, in reply, contained an opinion *diametrically opposite to the former*, with an *investigation of the structure of the parts, &c. to prove the truth of my opinion*. This investigation Dr. Bradley did not choose to print, I am now warranted to say, because it would have been conclusive in my favour; and, having unworthily withheld the evidence, the Editor of the Medical Journal then falsely said, that what I had written was *but an opinion*, opposed to an opinion on the other side.

To the third, I reply with firmness, that it is a false and scandalous, if not a wilful misrepresentation of what I had written: it is almost three years since the manuscript was entrusted to Dr. Bradley; I have no copy, and therefore quote from memory; under these circumstances it cannot be expected that I should repeat the words exactly; but, being well assured of the fact, I declare my assertion was "That Mr. Lee was regularly educated for, and engaged in the practice of surgery; he was a member of the Corporation of Surgeons; he had convinced himself, that an operation like that which was proposed in the paper I was refuting, would radically cure ruptures:" my argument was, that as such a man, so qualified, had determined to found his fame and fortune upon his success in this operation, he would, *in all probability, perform it well*: he had numerous opportunities of performing this operation, but never did perform it with success; he fell into discredit, and then formed a plan of fraud by which he supported himself for the rest of his life, at the expense of the credulous, whom he pretended to cure of ruptures. I contended, that this man's failure in his undertaking was to be considered as strong practical proof that the operation proposed was not likely to succeed, and I submit to the decision of the reader, whether what I said of Mr. Lee will warrant the construction which this Editor chose to put upon my words.

A6

At the time I made that communication, the foot had been reduced from the deformed state then described, and represented

As no champion chose to appear, the next month Mr Carlisle himself stalked forward, with all the dignity which so well becomes him. As this gentleman is a very great man, at least in his own conceit, I must retreat backwards, to receive him with propriety.

The Editor, pluralizing himself, instead of saying *plain, little, I*, calls upon "the anonymous author to give his name, otherwise *they* shall be "under the necessity of giving the priority of that *proposal to Mr. Carlisle*," &c. &c. Again, he says,

"This is but an opinion, and the opinion of the PROPOSERS is in direct "opposition to it." Thus, if a plain man may presume to understand the construction of common language, does this Editor indicate a claim for Mr. Carlisle, as having proposed that *very operation* (which the anonymous writer professed to recommend), six weeks *before* that letter was received. The intimacy of Mr. Carlisle with the Editor is well known; and it is not to be presumed, that he would bring Mr. Carlisle's name into public, upon a subject which *might* produce a dispute, without his knowledge and approbation; yet, Mr. C. says, ... But lest I should be accused of misrepresenting *either his words, or his meaning*, I shall insert his whole letter, and mark, in *Italics*, those parts on which it is necessary to make some observations.

To the Editors of the Medical and Physical Journal.

GENTLEMEN,

The letter from Mr. S. Cooper, in your last Journal, demands my thanks for his ready explanation.

It was never my design to assume any merit for priority as the inventor of a cure for Hernia. I had consulted all the orthodox authorities on the subject of such operations BEFORE I ventured to form a plan of my own, founded on the modern improvements in surgery. These thoughts were eventually laid before my colleagues at the Westminster Hospital, on an occasion which seemed to warrant the enterprise.

A bricklayer's labourer, under twenty years of age, applied to me for the means of procuring a truss; he had a Scrotal Hernia, descending through a widely dilated abdominal ring, and the nature of his work had rendered it difficult for him to keep a sufficient pad firmly over the orifice. The moral considerations of this individual case, induced me to propose an operation to him for a radical cure, and he consented to abide the event. *My colleagues were of opinion, "That the danger to life was inconsiderable, but that the chance of the intended success was not great."* I willingly risked my professional character on the latter point, because I had reason to be assured in my own judgments, founded on the peculiar precautions in my intended operation, that the success

represented in the first plate which accompanies it (pl. 26 of this work), to the general form and appearance of a natural foot,

success would be nearly certain. *This man, however, left the hospital clandestinely, after having been cured of the venereal disease.*

As Mr. Cooper's first proposal contained many of the very quotations in favour of an operation for the radical cure of Bubonocoele, which I had publicly urged, and as only the initials of his name appeared to that proposal, it looked as if some unknown person had USURPED that pretension, without any of the merit which I now acknowledge is due to Mr. Cooper.

The particulars of my designs for conducting this operation are, AT PRESENT, *unknown to any other person*; and it may be sufficient for the present purpose to say, that I have deliberately weighed the moral and professional considerations which attach to this subject, and having compared these with my experience in similar operations, I have not hesitated to conclude, *that opportunities are often arising in the practice of surgery, wherein this operation would be not only justifiable, but as eligible and necessary as the operation for the radical cure of the Hydrocele.* Under these impressions, *I am ready to perform this operation whenever all the circumstances conspire to make it prudent, and to promise ultimate benefit to the patient.* In your *Note to Correspondents*, it appears, *that some person (perhaps interested to prevent the radical cure of ruptures) has endeavoured to condemn the attempt. Such person should wait until the arguments in its favour, and the plan to be adopted, are fully before the public; and which it is my intention to undertake as soon as the operation has been fairly tried.*

I am, &c.

A. CARLISLE.

Soho Square, April 14, 1803.

The wonderful sublimity, or astonishing confusion* of Mr. Carlisle's ideas, in the above *little* letter, may circulate with such brilliant rapidity around the sensoria of those whose greatest qualification is a small portion of common sense, that they may not, with all the attention they may direct to the study, understand the real facts, which, to assist them, I shall endeavour to reduce to order,

Mr. Carlisle first says, "it never was his design to assume any merit for priority, as the inventor of a cure for Hernia;" yet, immediately adds, "he ventured to form a plan of his own," which *thoughts* were eventually laid before his colleagues, at the Westminster Hospital, &c. Then, upon the proposal appearing in the Journal, it "looked as if some unknown person had

* If I was certain that I had not quite forgotten all my early reading, I needed not to express this so cautiously: I believe that Burke specifies confusion and obscurity as being two causes of the sublime; if he is right, I might have boldly complimented Mr. Carlisle upon the astonishing sublimity of his letter to his friend, the Editor.

"usurped"

foot, which is likewise represented in an accompanying pl.
27. But there were several circumstances which would dis-
R 2 tinguish

"*usurped that pretension*," &c.; and, finally, though *not to conclude*, "the particulars of his designs for conducting this operation, are at present unknown to any other person."

I should very unwillingly attempt to reduce Mr. Carlisle's whole letter to plain, common sense, but I beg leave, with all humility, to ask, whether, when a man "forms a plan of his own," the "particulars of which are unknown to any other person," and seems offended that any other person had "*usurped that pretension*," it does not seem as if he (virtually, at least) "assumed merit for priority, as the inventor of a cure for Hernia?"

Again, I beg leave to ask, if Mr. Carlisle did not "explain the particulars of his designs for conducting this operation" when he laid his "thoughts before his colleagues at the Westminster Hospital?" If he *did*, "they could not be unknown to any other person:" if he *did not*, it is impossible to conceive how those gentlemen could venture to give their opinion on the subject: the cause of the patient leaving the hospital too, would be a secret worth knowing, but must remain unknown till he, who was the occasion of it, chooses to explain.

None of us can tell, correctly, what he would do in situations of unforeseen difficulty; but I really think, if I was surgeon to an hospital, and had taken a patient in, with the declared resolution to perform an operation which the best judges should declare was not dangerous to life, though the chance of success was inconsiderable, I should pause, and look for encouraging opinions out of my own circle; and, if no one advocate should appear, *I might* be tempted to give the fellow a few shillings, to run away from the house: the *moral considerations* of the case, both as they respect the patient and myself would, I think, bear me out in this: he would be saved from a painful operation, and I from the mortification of relinquishing my operations and projects, which I found were universally disapproved of, at the same time that I might talk confidently of my determination to perform my operation whenever a suitable opportunity presented itself, though I had, in fact, determined never to perform it at all.

But to return from this digression with the expression of the Poet,

That "Bad begins, but worse remains behind!"

At the end of his letter he lays a decent injunction upon some person, against whom he throws out a most indecent illusion, not to condemn the attempt until the arguments in its favour, and the plan to be adopted, are fully before the public, "which it is his intention to undertake, as soon as the operation has been fairly tried." The arrogance of this exceeds any thing that I have met with: some person writes a paper upon a particular subject, an answer to *that* paper is written, without its author being known, or any person or thing being alluded to, but the mere subject of the original paper; all the tricks that have been mentioned are played off by Dr. Bradley or the Editor

tinguish it from a foot in the natural and perfect state, which could not be made evident in a drawing, but which it is necessary to describe : the ancle was ill defined ; there was a looseness both in the ligaments and integuments, as well as want of power in the muscles, which rendered the foot useless, as to all power of voluntary motion ; though, when supported by a proper instrument, she could stand upon it, and walk to a considerable distance without inconvenience : but the
most

to misrepresent the answer, at the same time that he with-holds it from public view ; when no artifice can induce any person to write a line on the subject, Mr. Carlisle stalks forward, and, with the air of a dictator, lays an embargo on the subject, *because he intends, at some future period, to honour it with his attention.**

I regret that it has been necessary to employ so much time on this subject ; but the indeecency of Dr. Bradley's conduct, has made an explanation necessary ; the facts that have been mentioned are sufficient for the purpose, and every one will form his own opinion upon them. I may be mistaken ; but, till I am better informed, I shall certainly believe that Dr. Bradley, not thinking himself competent to decide on the subject, shewed my papers to his friend Mr. Carlisle, who, already irritated that his projected scheme had not been honoured with the approbation of his colleagues at the Hospital, and maddened at the sight of this paper, which perhaps confirmed all the objections that had been made to his own favourite project, advised the Doctor first to discredit and then to suppress it ; and, as a farther punishment for my presumption, he might have advised him never to insert any thing of mine in his *most important and valuable Journal*.

If Dr. Bradley *was* not actuated by some such motive as I have assigned for his conduct, in rejecting the sequel of a communication which he had inserted in the Journal, I shall be happy to learn, what were his motives, and how the paper to which I allude is disqualified to appear in company with the former part ? If he *was* actuated by such motives, I advise gentlemen who may choose to send papers to be inserted in that most valuable and most impartial Repository, for the improvement of medical science, to consider, beforehand, to what a situation they may expose themselves.

* I acknowledge freely, that I should have been more arrogant and more contemptible than Mr. Carlisle, if I had undertaken to condemn, directly or indirectly, any undertaking of his, particularly one, "*the particulars of which were unknown to any person but himself.*" The truth is, I thought no more of Mr. Carlisle than I did of Captain Bobadil ; I wrote a plain answer to a printed paper in the Journal, without forming a conjecture about the author of it ; and why this should have excited that great man's wrath, is more than I can understand, or any one else, except those who guide the wires which move the puppets of the Medical Journal, to play off their tricks, for the advantage of those who are in the secret.

most remarkable circumstance was the extreme smallness and weakness of the tendo Achilles; when viewed behind, the lower part of the leg seemed as round as another leg, would be if the tendo Achilles was taken away from it, and when the foot was forced into action as much as possible, the motion of the tendo Achilles could, with some difficulty, be felt. All these defects are now completely removed; the ancle-joint is as firm, and as well defined, and all the tendons of those muscles which move the toes, are as large and as perfect as those of any other foot; the tendo Achilles too, is now become as large and as perfect as that of any other leg: she is able to use the whole limb as well, in every respect, as her other leg, in taking any kind of exercise; but, when she walks carelessly, that leg appears to be weaker than the other, though when she is careful, as when she is walking under the direction of her dancing-master, there is no difference whatever perceptible in the action of her two legs.

In my original communication, I described the alteration that had, at that time, taken place in the size of the leg, I shall now place in one view the alterations in the size of the leg at different periods, from the commencement of the cure to the present time.

	As originally Diseased.	As restored in 1801.	At present.
	Inches.	Inches.	Inches.
Length of the foot	6 $\frac{1}{2}$	7 $\frac{1}{2}$	9
Breadth of the foot at the toes	3	3 $\frac{1}{2}$	3 $\frac{1}{2}$
Circumference at the toes	7 $\frac{1}{2}$	8 $\frac{1}{2}$	8 $\frac{1}{2}$
Over the instep and round the heel	9	10 $\frac{1}{2}$	11
Smallest part of the leg	5 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{7}{8}$
Largest part of the leg	8 $\frac{1}{2}$	9 $\frac{1}{2}$	11 $\frac{1}{2}$
Length of the leg from the patella to the heel, when standing on the ground	11 $\frac{1}{2}$	14	17

In comparing the size of the leg in its originally deformed state, with that to which it was restored in 1801, the great difference in size must be principally attributed to the different arrangement of parts, which, in the one case constituted the deformity, from the manner in which the same parts were arranged in their natural state: but the difference between the size of the leg in 1801, and its size at the present time, is to be attributed to its growth in the natural state; and it is evident, that it has grown

as

as much as the leg of any other person would have done in the same space of time ; and the whole history of the case affords the strongest proofs, that such a derangement of parts, so numerous, and so complicated in their connection with each other, as the bones, tendons, and muscles of the leg and foot are, may take place for a number of years, so as to constitute an apparently irremediable distortion, and yet be perfectly restored to their natural form ; and that the powers of those parts may be apparently lost for many years, and yet be so perfectly restored, as to resume, permanently, all their natural functions.

This may justly be called an extraordinary case in all its parts ; but though it has, on that account, excited much attention, its value would be but small, if it had not much stronger claims to notice ; it furnishes data which will enable us to prove, that a very numerous class of diseases called contractions, distortions, &c. of the extremities, have been prematurely abandoned as incurable, though they may, in fact, be as certainly cured as any other disease.

In the observations which I attached to the history of the case in 1801, I was obliged to argue, hypothetically, on the probability of effecting the cure of such diseases ; the facts of the case now authorise me to say, with much certainty, that many diseases of this kind have been abandoned as incurable which certainly may be cured, and an explanation of the facts will, it is presumed, afford sufficient ground to justify the above conclusion.

An opinion has been entertained by those who would admit that such distortions may be cured in *early infancy*, that after the age of two years, or thereabouts, when the ossification of the bones is tolerably complete, or they are set, as it is commonly called, malformation of the bones begins to take place, and when it has gone on for some time, opposes an insurmountable obstacle to the cure of such diseases, in those patients who are farther advanced in life. At the time I published my Essay on the Club-Foot, I had been successful in curing that disease in young patients, I had begun to succeed in patients farther advanced in life, and having heard the objection above-mentioned stated in argument against the probability of success, in curing those diseases in patients far advanced in life, I employed some time to shew, by induction from facts perfectly well known, it was probable that, if such malformation of bones should have taken place, the operations that were necessary to cure the diseases, would correct the

the malformation of the bones which were concerned in it : though these arguments were allowed to have weight at the time they were published, it is not necessary to recur to them, since it is evident, that no such malformation did take place in this case ; all the bones of the foot were deranged from their natural situation at the age of two years, and that derangement was continually increasing in degree, and the parts becoming firmer and more rigid during eight years, yet no obstacle was presented to the cure by the preternatural form of the bones ; so far as *they* were concerned in the disease, it was derangement in their relative situation merely ; when the means were applied to make that arrangement perfect, they fell into their natural situation, and resumed their natural functions, as perfectly as if they had never been deranged.

It was said, when my attempt to cure this leg was canvassed, that there was a natural tendency in all parts of the body to grow in a peculiar form ; but, where two parts continually acted upon each other, a part of the form was the consequence of the action, and if that was interrupted, and the parts separated from each other, a different form would take place ; thus it was said, the scaphoid cavity of the tibia, and the circular head of the astragalus acting continually upon each other, in every motion of the foot, produced the convexity of the one and concavity of the other ; and as in this patient those parts had been separated for eight years, the scaphoid cavity at least would be obliterated, and as there were no means of restoring that cavity, a cure would be impossible. This objection, though not without plausibility, certainly was without foundation, for, in a few months, those parts were brought into contact with each other, and resumed their natural functions as perfectly as if no derangement had taken place. So far as a general conclusion may be drawn from a single case, we are authorised to conclude, till the age of ten years, malformation of bones opposes no obstacle to the cure of these diseases, and that, so far as the bones are concerned, they are perfectly passive.

Ligament is said to be, when in its natural state, insensible, inelastic, extremely strong, more easily lacerated than extended by any violent action, and when it has suffered injury from any violence, it is extremely unapt to recover its natural power. With this knowledge of the general nature of ligaments, it will certainly be curious as well as important to ascertain what actually happened to the capsular ligaments, and other ligaments which se-
cure

once the ankle-joint in this case, during its progress from the natural to the deformed state, and from that deformed state back again to the perfect state in which it now is.

The capsular ligament, the ligamentum anticur-apia, and the anterior ligament of the astragalus, as well as the other ligaments which join the bones of the leg to that of the foot, all which, in the foot which in its natural state combined to strengthen the joint, and, confer the parts of which it is composed in their natural position, were have been gradually extended, as the astragalus moved forwards out of its natural station, till the deformity had attained to the height it was when in the state represented in the plate, p. 464, Vol. V. of your Journal.* Upon turning to the figures represented in that plate it will be seen, that the astragalus was completely thrown forwards, the scaphoid cavity of the tibia resting, in part, upon that portion of the astragalus which joins to the os cubia, and the remainder upon the os calcis itself.

The capsular, on the back part of the joint, as well as the ligamentum fibule posticum superius, middle perpendicular ligament, &c. &c. were, by the same movement of the bones forwards, preternaturally lengthened, and as the foot had gone into this state by slow degrees during several years, these ligaments had assumed a permanent form, and confined all the bones of the foot most rigidly in their unnatural situation, and gave rise to the notion of anchylosis, in the minds of some who saw the case, and found the foot was not capable of the least motion; yet, in a few months, every obstacle that this state of the ligaments opposed to the cure was removed, the bones of the foot placed in their natural position, and the foot, so far as relates to mere FORM, was cured: but the ligaments, in consequence of the alteration they underwent, were so weak in their texture, and so loose in their connection with each other, that they could not support the foot in its natural position, or admit of any voluntary action; it was perfectly useless, except as a support to stand upon; but now all its powers are completely restored, the foot is capable of every natural action, and it is to be presumed, that the ligaments have regained, and will permanently keep their natural form and powers, except that they are not, at present, quite so strong as they would have been if they had never been deranged. I believe the facts of this case prove more strongly than any other that has been

been narrated, how much the condition of ligaments may be altered in the progress of the disease, without being irremediably deranged.

As partaking of the nature of ligaments, the tendo Achilles certainly claims the most attention in this case; not as being actually reproduced, but, as increasing so much as to be next in degree to reproduction. When the foot was first reduced to its natural form, the leg seemed to be as round on the back part as any other leg would have been had the tendo Achilles been removed from it: upon moving the foot to its greatest extent, that tendon could not be felt for a considerable time; at last, a small motion was perceptible near the os calcis, which gradually proceeded upwards, till the gastrocnemii muscles as well as the tendo Achilles were completely in motion; that motion is now voluntary, and the muscles as well as the tendo Achilles have attained their full powers, so far as to equal those of the other leg, under the exertions of walking and dancing for a considerable time; though it is probable, that if any of those exercises were pushed to great excess, this leg would fail under the exertion, in less time, than its fellow would.

From the history of this case many conclusions may be drawn, to regulate our opinions on the subject, which will be extremely different from what have been commonly entertained upon diseases of this kind.

1st. That the notion which has generally been entertained, that distortions in the legs, &c. if they can be cured at all, cannot be cured after the patient has passed the age of two or three years; on the contrary, it may be presumed, that they are to be cured at very advanced periods of life, provided there is nothing in the state of the parts which amounts to a physical impossibility that they should be altered.

2d. That where there is no loss of organic substance from disease in the soft parts, but only wasting of substance, from whatever cause, the state of the muscles, tendons, and ligaments does not oppose any insurmountable obstacle to the cure.

3d. That an insurmountable obstacle will arise to the cure of such distortions, where the bones have been so diseased as to occasion ankylosis; that an insurmountable obstacle *may* arise when malformation of particular bones has taken place, to an extent that would prevent them from being reduced into their natural position; or render them incapable of acting in the natural manner, if they

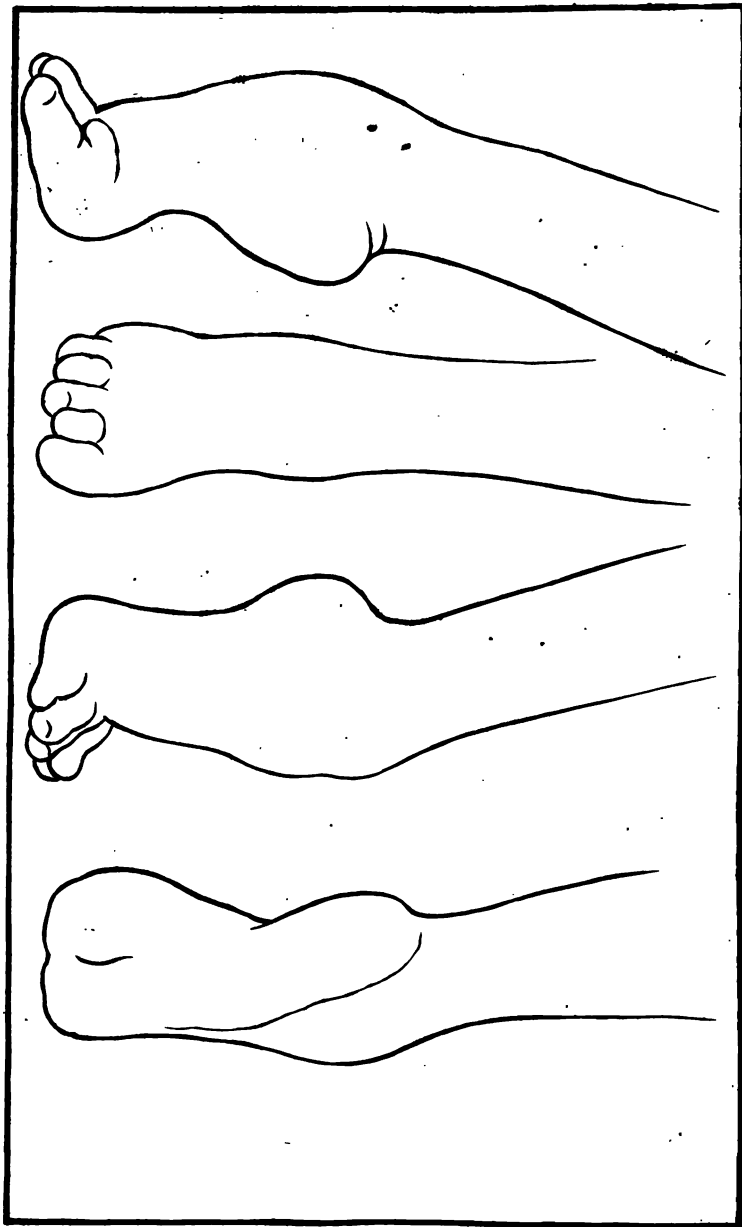
were reduced into that position ; but it is certain, that no such malformation had taken place in this case, dreadful as it was, though it had existed for so many years, and it is probable that there are many, equally hopeless in appearance, that may be certainly restored to a perfect state.

As it might be supposed that I have been too sanguine in drawing these conclusions from this single case, I beg leave to add the two following, which, it is presumed, will confirm every thing that has been advanced on the subject.

C A S E L X.

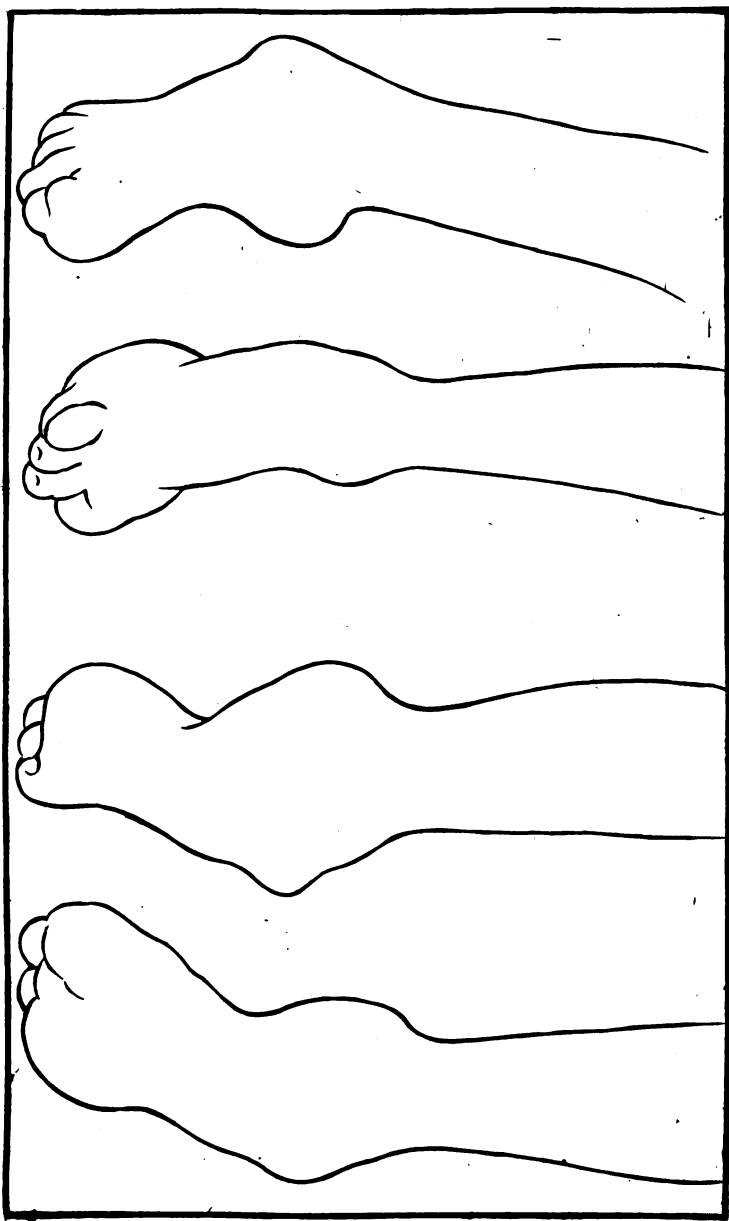
A servant trod, by accident, on the foot of a child, about two years old ; the accident was not mentioned till the parents perceived she was unwilling to stand or walk. A medical gentleman in the neighbourhood was consulted, who did not, in all probability, discover what injury was sustained, as he directed that nothing should be done, and only advised that the child should not be suffered to stand upon its foot till it was quite well ; this advice was literally followed ; the child was unwilling to stand upon its foot, and they provided her with crutches, upon which she walked constantly, till I first saw her, when she was ten years old. In consequence of this treatment she had not the least use of her foot ; it was as much distorted as that of Miss H., and perfectly rigid ; the particular form in which it was fixed may be understood from the annexed pl. 28, which contains four views, drawn from a cast I had taken in plaster of Paris from the foot at that time, and which is still in my possession.

I had been then long engaged in successful experiments on this subject, but had not been entrusted with a patient so far advanced in life as this young lady was ; my hopes of success were sanguine but speculative, drawn by what I thought fair induction from facts that I had observed in other cases, and applied to what appeared to me to be the circumstances of this ; her father was desirous that she should be cured, but required that I should convince him that I had cured patients who were quite as bad as this young lady was. As I could not give this proof of my success, he refused to make the attempt, and the child was to remain in the state she then was ; but it was agreed, that I should contrive an instrument by which she might be enabled to walk on her foot, without the use of crutches, which



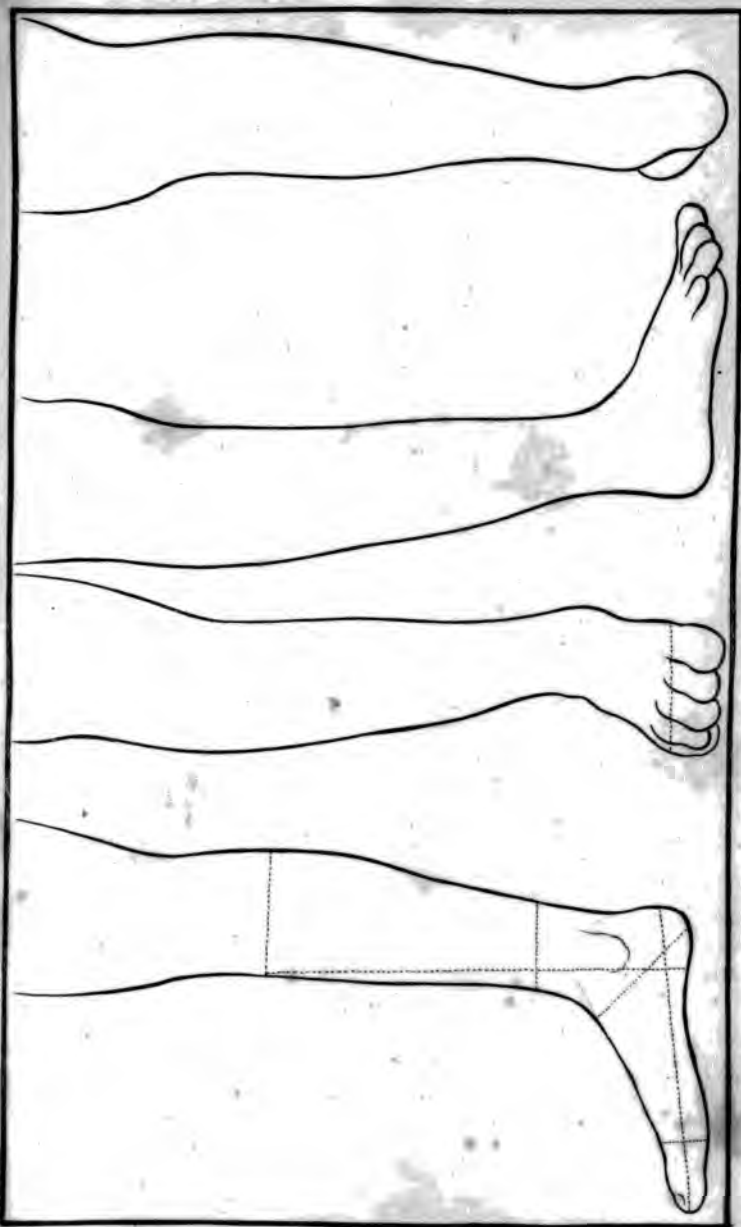


Pl. 29.





1730.





which I effected, and, from that time, the crutches were laid aside.

Three years afterwards her father died, and her remaining friends, influenced by the opinion of a gentleman who knew the history of some patients who had been under my care, determined to place her in my hands, in expectation that she would be cured.

The actual distortion of the bones of the foot appeared to be nearly in the state it was in when I saw it last, but the foot *appeared* to be more deformed, because the soft parts had been unequally pressed upon by the instrument which had been used to enable her to walk, though there was no additional distortion of the bones to make the case worse than it was when I saw her last. A model was taken from the leg in this state, which is represented in pl. 29.

As so much time had been lost, and she was now fourteen years old, it was resolved to proceed without delay; but, just as we were going to begin, she caught a violent fever, and it was necessary to wait till that disease was removed; the debility consequent to it was, perhaps, not an unfavourable circumstance, as the foot made less resistance to the application, and the patient, of course, felt less pain than she would have done had she been subjected to the same treatment when taken in a state of high health.

The first application was made in March, 1802, and continued regularly, in the same manner as with Miss Haythorne, till June 21, 1803, when the foot was reduced to the state represented in pl. 30, which exhibits four views of a model taken from the foot at that time. The foot was reduced nearly to the natural form, and she could stand upon it in the natural position, but she could not, by any means, bend it at the ankle joint, so as to elevate the toes, nor had she the voluntary use of any of those muscles which are used to lift the foot. The fleshy parts of the leg were remarkably increased in size, the roundness of the back of the leg was much more apparent than in Miss Haythorne, and, at this period, the tendo Achilles could not be felt at all. From that time to the present, she has been gradually improving so much, that the leg and foot have now nearly their natural *form*, though they are very far from having gained their *natural powers*.

The first circumstance which distinguishes this case from that of Miss Haythorne is, the difference of time that was required to produce an equal degree of alteration: it is two years and a half since the cure of this case was

begun, but from this time about eight months must be deducted, because twice in the year she has returned into the country on visits to her friends; this time has not only been lost, but has necessarily protracted the cure in other respects; for, as it requires some time to accustom the parts to the action, so as to bear the full effect it may be applied to produce, and as every thing was necessarily suspended during her absence, each time that she returned, a certain portion was occupied in bringing the parts to bear the full effect of the powers that were employed. Had the cure been continued without intermission from beginning to end, this time would have been saved, and the cure much sooner effected.

The other distinguishing circumstances of this case are, the slowness with which the tendo Achilles has increased in size, and begun to shew itself in action, and the great increase in the size of the leg: the first circumstance may be fairly attributed to the patient being at a more advanced period of life; the second, to the general state of her habit. Miss H. from long ill health, as well as general habit, was extremely thin, and though now healthy, is not inclined to embonpoint; the other lady was naturally stoutly made, and since she has been under my care, has much increased in size. The annexed pl. 28. shows four views of the foot, taken from that cast that was made before she had walked upon it: pl. 29. exhibits four corresponding views of the foot, taken after she had walked upon it. The difference between these two shew particularly what effect was produced by the effect of pressure from the instruments and walking upon the foot; and pl. 30, contains corresponding views of the leg, from the model which was taken Jan. 21, 1803, when the leg was nearly reduced to its natural form, but not so perfect as at present. I add correct measurements of the leg, taken at three different periods, from the models which are still in my possession. The direction in which the measures were taken are marked with dotted lines upon one of the figures,

	In the Diseased Foot.	As restored June 1803.	At present.
	Inches,	Inches,	Inches.
Length of the foot	$6\frac{1}{2}$	$7\frac{1}{2}$	$8\frac{1}{2}$
Breadth of the foot at the toes - - -	$2\frac{1}{2}$	3	$3\frac{1}{2}$
Circumference at the toes	9	8	$8\frac{1}{2}$
Over			

	In the Diseased Foot. Inches.	As restored June 1803. Inches.	At present. Inches.
Over the instep and round the heel	9 $\frac{1}{2}$	10	10 $\frac{1}{2}$
Smallest part of the leg	7	7	8
Largest part of the leg	10	11	12
Length of the leg taken from the patella when standing on the ground	14 to the bottom of the heel not being able to touch the ground.	15	17 $\frac{1}{2}$

Such are the alterations that have taken place in the form of the leg and foot, and the relative proportion of the parts; and though it cannot at present be said to be cured, its resemblance, in every point, to that of Miss H. is such as to warrant a hope, that in due time the cure will be equally complete.

As tending to illustrate the subject, I shall be excused for adding the following case.

CASE LXXI.

A gentleman, at a very early time of his life, met with an accident which injured one of his feet; he does not recollect the circumstance, but was told by his parents, it was occasioned by the misconduct of a servant; he remembers that he walked upon his toes only, that as he grew up his leg wasted, and his foot became more deformed. About eight years ago he applied to me for some contrivance, that might enable him to walk upon his foot without increasing the defect: this he was supplied with. In April 1803, he applied to me again, and seeing the alteration that had been produced in the preceding case, was willing to try what could be done, with a view to restore the natural shape of his foot. He was then twenty-five years old, and his foot was rigidly fixed in the form, which is represented in the annexed pl. 31, fig,

* It is to be observed, that *these* measures are taken upon the leg itself, as I have not taken a model at the present time: the measures are therefore less, in proportion to the others, than they would be if taken upon a cast made from the leg.

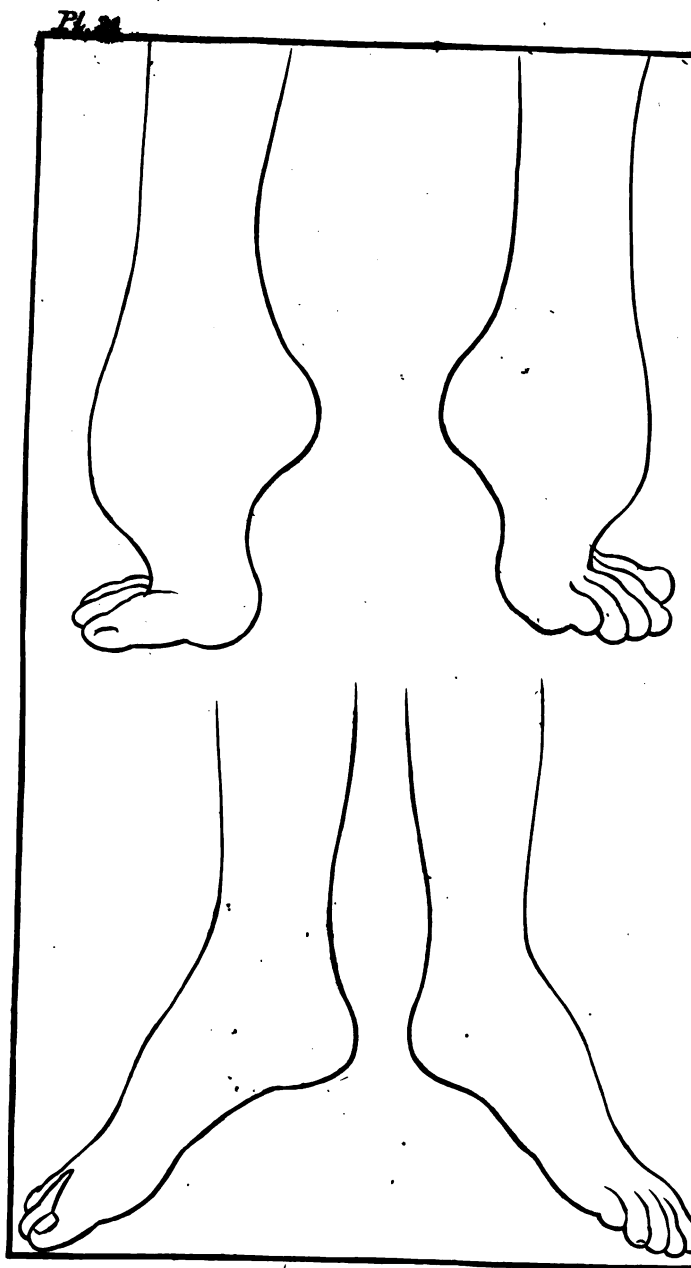
fig. 1. 2. The figures were drawn from a model which was taken from his foot, at the time he came under my care; the same system of extension was adopted that had been applied in the former case, and with similar success; for, in the month of October following, his foot was restored to the state represented in fig. 3. and 4. of the same plate, which are drawn from a model that was taken from the foot at that time. The alteration was so great, that he determined to prosecute the cure; the improvement proceeded in the same proportion till the winter, when, by imprudently exposing himself to cold, a chilblain was produced on the great toe, near the nail, which became extremely troublesome: I desisted from all my operations, and he consulted Mr. Lynn, who advised that nothing should be done till the toe was completely cured; this could not be easily effected during the winter: in the spring the death of a relation obliged him to return home, which he did, with a determination to resume the cure, whenever his engagements would allow him to return to London.

This case remains imperfect; but, as in the diseased state, it resembled the two former; as, as much alteration in point of form, was produced as in the former, and in as small a portion of time, we are authorised by every rule of analogy to conclude, that the event in this case would have been the same as in the former, if the requisite treatment had been continued for a proper length of time, and thus, the three cases taken together prove, that distortions to this very great extent, which had taken place in very early periods of infancy, may be radically cured, even so late as when the patient is twenty-five years of age.

As I do not wish to push this argument farther than the circumstances of the cases will justify, I shall be excused for going a little more into detail on the subject.

That the circumstances of the cases were similar, so far as relates to derangement in the natural state of the parts, and degree of the rigidity, cannot be doubted; it is equally certain, that the obstacles which were opposed to the cure were the same in all, except such as were occasioned by the difference of age in the patients: thus we see, that it required more time to reduce the foot of a lady, aged fourteen, to its natural form, than it did that of Miss H., who was only ten years old when the cure was begun; and, by fair induction we are authorised to conclude, that it would require still more time to reduce that of the patient, aged twenty-five years, to its natural form, than was necessary in either of the former; but, that the

natural





natural form would be equally restored in all, there can be no reasonable doubt.

In all these cases, when the feet have been reduced to their natural form, the tendons are weak and small, the muscles incapable of action; in short, the limbs are useless to all the purposes of voluntary motion. This circumstance, too, seems to continue for a length of time, proportioned to the age of the patient; in Miss H. there is no circumstance remaining to distinguish the leg which has been distorted from its fellow, or from the leg of any other person: in the lady aged fourteen, the tendo Achilles has not increased so much in size, nor the gastrocnemii muscles in power, as those of Miss H. did in an equal space of time; yet, they do increase sensibly, and, this being the case, there can be no reason to doubt that they will, in time, be as perfect as the former. It is not unreasonable to conclude, that the power of using the limb will, if the cure is resumed, be obtained in the case aged twenty-five years, though it is not to be supposed that the full size of the limb can ever be obtained.

It is a fact very generally acknowledged, that all animals grow most in a given space of time, immediately after the birth; that as they advance in life, they increase less in bulk in the same time, and that when arrived at maturity, they do not increase in bulk at all, except by the accession of fat. It is equally true, that muscular motion increases the size of muscles; that the action of those muscles, which constitute the fleshy part of the leg is, in these cases of distortion, impeded, because the action of the foot is impeded, deranged, or destroyed by the deformed state of that part; hence it invariably happens, that where there is distortion of the foot, there is invariably a wasting of the leg, increasing with the age of the patient, till he arrives at maturity, when it is always found, that those who have distorted feet, have the legs reduced to the smallest size possible. I have invariably found, that in proportion as the feet of those patients are reduced to their natural form, and gain the power to act in the natural way, the size of the legs is likewise restored; in many patients entirely; in all, in proportion to its deviation from the natural size, and the age of the patient. Thus, in Miss H., the leg was restored to its full size; in the other lady, the leg was likewise restored to its full size, though it required much more time to effect this in the latter case, as the patient was four years older before the cure was begun. If we may reason by analogy from these cases,

cases, to that which has not yet been completed, we should say, there is every reason to suppose the foot, in this case, may be restored to its natural form and powers; but there is every reason to believe, that although the leg will increase something in size, it will always remain much smaller than the other leg.

Having inferred, from these cases, that similar distortions may be cured at a much later period of life than has, till now, been thought possible, it is but right to add, that the earlier the period of life at which these cases are undertaken, the better it will be for the patient; as the time requisite to effect the cure, as well as the unavoidable sufferings of the patient will be lessened, by attacking the defect in early infancy, or as soon afterwards as possible.

An opinion has been very generally entertained, that when distortions of the feet exist before the birth, there is always a preternatural formation of the parts; this is by no means the case: yet instances of malformation do sometimes happen; and, with your permission, I will send the account of a singular case of monstrosity of this kind, with drawings from the subject, if you think it will be proper for insertion.

I am,

GENTLEMEN,

Your most obedient servant,

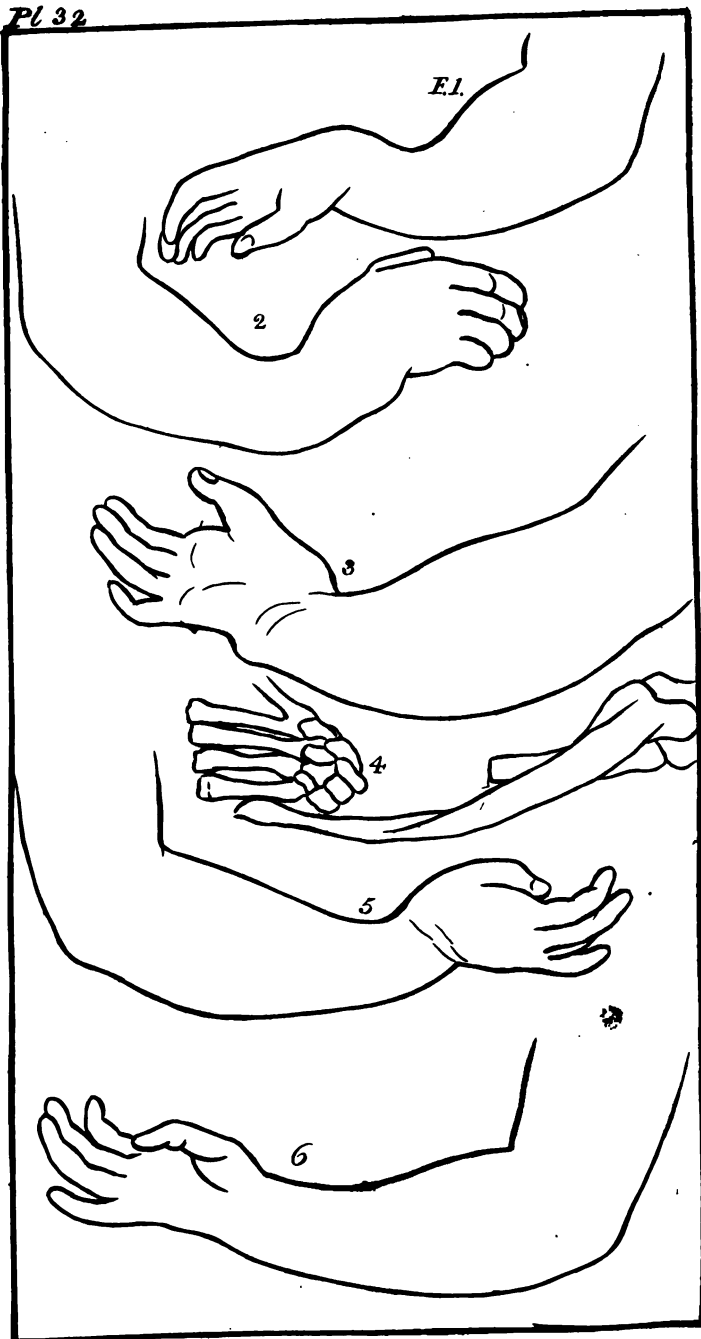
T. SHELDRAKE.

*No. 5, Montague-Street,
Russell-Square.*

CASE LXII.

In September 1801, I was desired to visit Miss L., who had a singular distortion of both her arms: she was at that time eighteen years old; the defect had existed from her infancy, and seemed to increase; it was therefore an object of consequence to remove the defect, if it was possible to do so; or, if it was not, at least to prevent it from increasing.

She had the use of both her hands, so far as to write, to draw, or play on the piano forte; but she could not turn her hands outwards, *i. e.* so as to lay the palm of her hands parallel to the zenith: the fore arms were remarkably short,





short, were much bent in the middle, and appeared to be twisted; and, *as it seemed, from this form and position*, there was no rotary motion. The form of the hand and arm will be better understood by referring to the annexed pl. 32, which contains two views of the right arm and hand; these are drawn from a model which I had taken at the time she came under my care; the left arm was in a similar situation, but not so much deformed.

The young lady's mother endeavoured to account for this misfortune in various ways; she had been told it was the effect of rachitis. The child, when young, had been entrusted to a careless nurse, who neglected her duty in every respect, and, among other circumstances, she was known to have had a trick of lifting the child by her hands, and to this practice the distortion of its arms was attributed. People are always willing to account for every thing that happens to themselves or relations; and, when any thing uncommon occurs, task their memories, and sometimes their invention, to account for the accident. This was undoubtedly the case on the present occasion; for, however plausible these accounts were, it eventually appeared, that they could not be assigned as the real causes of the defect.

As she had the perfect use of her fingers, and the wrists were capable of their natural motion, it was evident that no defect existed in them: from the fixed position of her hand, the general appearance of the arm, and the total incapacity for rotary motion, it was presumed that the bones of the arm were twisted over each other as well as bent, and that this form and position of the bones of the fore arm were the real impediments to the rotary motion of the hand. If this proved to be the real cause of the defect, it would follow of course, that the only way to remove or diminish it would be by turning the hand round, till the radius and ulna were laid parallel to each other, when the real state of the case and the degree of relief that might be afforded could be ascertained.

Considering the age of the patient, and the time this defect had existed, it was expected that this operation would be both tedious and difficult; but it was with much surprise I found, that in less than three weeks a visible alteration in the position of the hands was produced, and, in about four months, the hand was completely turned round, and, in consequence, the real state of the defect was discovered, and proved to be very different from what had been imagined.

The motion of the elbow-joint was perfect, and she was able to bend her hand at the wrist-joint as well as any other person, but the radius was entirely wanting for about half its length. When her hand was turned quite round, so as to place the palm upwards, the arm appeared straight; but upon feeling downwards from the elbow, in the course of the radius, that bone was distinctly felt for about four inches, and then the *end* of it could be felt: it terminated as abruptly as it would have done if it had been amputated. Upon feeling from the wrist towards the elbow, the radius could not be felt at all, till we reached the end of that bone four inches below the elbow: between this point and the wrist there existed but one bone (*viz.* the ulna), in the arm. The deficiency of the radius was as distinctly felt as it could have been if it had been possible to open the arm and amputate the radius, in the part that has been mentioned, and close up the wound, so as to leave the soft parts perfect. In one of the figures in the annexed pl. 32, I have marked, with a dotted line, the course of the radius, so far as it went, consequently, the deficiency will be understood.

This discovery of the real state of the defect, necessarily terminated all hopes of effecting a radical cure; it likewise demonstrated the necessity of adopting some plan to prevent the increase of the defect, which, from the necessary action of the parts, would otherwise be unavoidable. The flexor muscles of the hand are stronger, and more used than the extensors; as in lifting, or drawing any thing towards us, *they* are principally used, as well as in the rotary motion of the hand, which includes a great majority of the actions of the hand, in which strength is used; accordingly, this lady was able to lift a considerable weight, or draw any thing towards her with much strength, but could perform no actions the reverse of these; and the frequent occasions she had to perform such acts, or even the frequent movement of her hands in those directions, actually had produced much of the deformity that existed, and would certainly continue to increase it.

The radius and ulna preserve the length as well as the form of the arm, which must necessarily be distorted if either of those bones were imperfect, which was the case in the present instance. The ulna is the most firmly articulated with the humerus, as this articulation has not only the hinge-like motion, but is so connected with the radius and carpus, as to allow of all the motion the hand is capable of in every direction; on the contrary, the radius

is firmly connected with the carpus; but is connected with the ulna by means of ligaments, and which allow it to move on the head of the tibia in every direction, and, at its junction with the humerus, is susceptible of all the motion that is required for it to rule over the ulna, when the hand makes its rotary motion. When that action is performed by turning the thumb towards the body, it is effected by contraction of the flexor muscles, the radius makes a resistance that yields to the action of those muscles, and again yields to the re-action of the extensors, but in every situation keeps the hand in its proper position. In this case more than half the radius was wanting; the carpus and hand were undoubtedly complete; but the ulna not having the radius connected with it, so that they might both support the carpus in the natural way, was attached to the outer side of the carpus; the consequence of this conformation was, that when the flexor muscles acted, the resistance which should have been made by the radius, was wanting; and during the eighteen years of this patient's life, previous to the time I saw her, the hand had been drawn out of its natural position, brought nearer to the elbow, and twisted and distorted in the manner that will easily be understood by referring to the annexed pl. 32, where it will be shewn, that the hand was not only distorted in the manner I have described, but had got so much out of its natural situation, that the extremity of the ulna, which should have been connected with the radius, was actually attached to the outer side of metacarpal bone of the little finger.

As soon as the real state of the parts was discovered, it became evident, that much of the deformity was occasioned by the action of the flexor muscles of the hand, and want of resistance to that action by the radius, and it was evident, that if some means were not tried to prevent it, the distortion would increase, till the hand became useless. To effect this desirable object, it was proposed to turn the hand outwards, and to extend it, and alter its position with respect to the ulna, so as to bring it as near to the natural length of the arm as possible; then to apply an instrument that should be so constructed, as to keep the arm extended without impeding the rotary action, or any other action of the hand. If this could be effected, any advantage that might be gained in point of form, or action, might be effectually preserved.

This was attempted, and completely effected in November 1802. An instrument was adapted to preserve the

advantages that had been gained; this instrument was so constructed, that when worn under a sleeve, it made the arm appear of a better shape than it was without it; and, with the use of this instrument, the patient was left to preserve the advantages that had been gained.

In the beginning of this case it was said that both this lady's arms were affected, but I have confined myself entirely to describe the right arm; as that was the most distorted: the left arm had a similar defect, from a similar cause, but the portion of radius that was wanting, did not exceed the length of an inch and a half. For this reason the distortion, and its consequences were less; they were treated in the same manner, and with the same success.

The state of this distortion was such, that it may not be easy to convey an adequate idea of it by reference to the annexed pl. 32.

Fig. 1. View of the inside of the arm, with the hand turned inwards, in the position she always held it; in this state she was able to turn it *more* inwards, as occasion required, but was not, on any occasion, able to turn it more outwards.

Fig. 2. View of the outside of the arm, the hand in the same position.

Fig. 3. View intended to shew the position of the hand with respect to the ulna; the inside of the hand is exposed fully to view; the ulna is seen joined to the metacarpal bone of the little finger; the carpus attached to the side of the ulna; the arm so twisted, that the olecranon is seen in a situation parallel to the palm of the hand.

The three preceding figures are drawn from the model which was taken from her hand and arm when she was first placed under my care, and still remains in my possession.

In Fig. 4. I have sketched the bones of the hand and arm in a position like that of fig. 3, to shew the situation in which it is presumed that those bones were placed relative to each other.

Fig. 5. is drawn from the model which was taken from the hand and arm at the time she was removed from under my care. View, outside of the arm, the hand turned outwards, and extended as much as it could be.

Fig. 6. View of the same model; inside, the arm, the hand extended in the same position as fig. 5.

If Fig. 6. be compared with fig. 1, and fig. 5. is compared with fig. 2, it may understood what alteration was produced

produced in the general form of the hand and arm, while this patient was under my care. It will be evident, that much peculiarity of form remained, but the position of the hand was so much altered, that upon measuring from the thumb to the bend of the arm, in the direction marked by the dotted line in fig. 6, the restored arm proves to be two inches and a quarter longer than the arm was in its original state. This additional length was preserved by the instrument which was applied to prevent it from retracting, when the rotary motion was performed at the same time, but it did not impede the necessary movement of the hand or arm; and it was so contrived as to conceal the remaining peculiarity of this shape in the arm. This lady went into the country when she was removed from under my care, and I have not heard of her since.

OBSERVATIONS ON CONTRACTION, OR RIGIDITY,

*Either accompanied by, or consequent to specific Diseases,
and producing Distortion of the Legs and Feet, with
Inability to make use of them.*

The most remarkable of the preceding cases were seen before they were placed under my care, by gentlemen who hold respectable situations in the profession of surgery. Numerous attempts had been made to cure them, without success, and it was generally believed, that every attempt to relieve them would prove unsuccessful. While they were under my care, they were seen by other gentlemen in the same profession, with whom I had occasional intercourse: these expressed their surprise at the alterations they saw taking place, and now that the patients have been placed in the respective situations that are described in the preceding narratives, they declare, the facts are so extraordinary, that if I had not preserved the models of each case, to shew what the actual state of each disease was at the time the cure was undertaken, it could not be believed that such diseases had existed, and had been removed so effectually as it is now proved that they have been. The strength of these opinions, and the history of the cases prove, that it is possible to restore the form and the active powers of limbs that were supposed to be irrecoverably lost: if any of these cases had existed, unaccompanied by any corresponding one, it would have been considered

considered as an extraordinary, and might have been thought to be only an anomalous fact; but, connected as they are, similar in appearances, though different from each other in degree of distortion, or incapacity for action, the amount of the whole proves, that a class of diseases which is not uncommon, has been abandoned as incurable, though a remedy for it is within the reach of human art. Here we might rest; but if we did, it might be said that the cure of these cases was empirical, (using that term in its old and best signification), and afforded no criterion by which we could determine whether other diseases, which might resemble these in *appearance* were, in reality, the same; or whether, by careful investigation, we could determine, *à priori*, how far any other case might be curable: it may therefore be of some use, if we endeavour to ascertain what state of the animal economy constitutes the disease and its varieties, what are the probable obstacles to a perfect cure, and how the means that are applied operate in producing the cure. At the end of each case has been inserted such observations as arise out of that case only, I shall therefore here confine myself to general considerations.

The term contraction is used in more senses than one, and perhaps cannot, with strict propriety, be applied to those diseases at all; but as it is almost universally, though most vaguely adapted in speaking of them, it may be necessary to say, that when it is used, in these observations, it is always intended to describe a deviation from the natural form of the limb, occasioned by improper combination of the bones which compose it; with rigidity of muscles and diminution of size in consequence, but without loss of substance, or absolute alteration in the structure of parts.

The cases that have been related may be classed under three heads, viz.

1st. Cases of simple contraction, from loss of action in the parts.

2d. Cases of contraction, the consequence of specific diseases; and,

3d. Cases of contraction existing at the same time with the constitutional diseases, which produced it.

The case of Miss H. is the most remarkable of the first class; and as the cure of it is as complete as it can be expected that the cure of any case can be, an accurate examination of the phenomena of that case will afford sufficient

sufficient means to afford a just estimate of the extent to which all similar distortions are curable.

I know not whether palsy is a common disease among children in general, but I have seen many between the ages of one and three years old, who had distortions in their legs and feet, with different degrees of inability for voluntary motion, and have been told, that these defects were the immediate effects of a paralytic stroke, connected with fever. In this case there is little reason to doubt the facts, but it is probable that the paralytic affection soon disappeared, and all the deformity that supervened, was the consequence of want of action in the parts; for when I saw Miss H. first, the leg was deformed, rigid, inactive, and insensible, but had not the flabby feet that always accompanies true palsy; all the symptoms that are above enumerated were, in all probability, the consequence of want of action in the parts, and, presuming that this was the case, I ventured to prognosticate, that as the leg was reduced into its natural form, supported in its natural position, and constantly kept by artificial means in continual action, the natural power of the limb, to act in obedience to the will would be, in the end, restored. This prognostic has been fully justified by the event. Now that this case is completely cured, it appears, than the leg which has been cured, is something weaker than the opposite leg, which circumstance occasions some inequality or halt in the manner of her walking; this is the natural, perhaps the unavoidable consequence of the disease. In this case the left leg was in some degree affected, as well as the right; but the affection in the left leg was, comparatively, trifling, and was soon well; of course, on comparing the two legs together, the left leg is to be considered as possessing nearly all its natural powers from the birth to the age of ten years, and the right, as being totally deprived of those powers, till the same period of life; those powers were gradually restoring, during the next five years, and, when so restored, as to give the patient the power of using her leg in the natural way, it possessed a degree of strength that had been obtained in the course of five years, opposed to the strength of the other leg, which had been gained in fifteen. The inequality is obvious; and though there is no doubt, that by due exertion the strength of that leg might be rendered equal to the strength of the other, yet it is not in the power of professional exertion to do it; it must be done by the steady attention, and unremitting exertion of the patient to her own situation; with that at-
tention

tion and exertion, their object will be completely obtained ; without them, they never will.

Case LX. is likewise one of distortion with total loss of power, in consequence of absolute discontinuance of action for several years : the recovery of form has been as complete as in the former case, but the recovery of power more tedious, partly from the interrupted manner in which it was attended, and partly from the patient being farther advanced in life before the case was attended to at all. It is an axiom, that all animals, supposing them to be healthy, grow faster in a given space of time, soon after their birth, than they would grow in the same space of time, at any subsequent period of their lives ; the quickness of their growth diminishing in proportion to their progress towards maturity ; whence it follows, that any alteration in the structure of parts which must be effected in such cases as this to produce a radical cure, necessarily must require a longer time to effect, according as it is undertaken at a later period of the patient's life ; and thus, although the cases which have been produced prove that such cures may be effected at very late periods, they hold out very strong motives, to induce us to undertake such cures at the earliest periods of existence.

Case LXI. was, undoubtedly, debility produced by accident, with deformity added to it ; because the weakened limb could not properly support the weight of the body. The age of the patient, according to received opinions, rendered all prospect of a cure hopeless ; yet, the alteration that was produced was so great, as to give well-founded hopes, that the cure of this case might be completed if it was persevered in, and proves, that we have not yet ascertained the period of existence at which nature loses the susceptibility of undergoing such permanent alterations, as are requisite to ensure the radical cure of distortions of this kind.

I have been gradually led to the consideration and cure of such cases as have now been related, by successful experiments upon slighter cases, by induction from those experiments, from acknowledged laws of the animal economy, and from what may be called historical knowledge, of what the superstitions of India stimulated their votaries to effect in distorting, and removing the distortions of the human frame. It is remarkable, that after having successfully established the possibility of effecting as much as they are said to effect, I should accidentally meet with a case which seems to prove the literal truth of all that has been related

related by travellers on the subject. No wretched Fakeer could more effectually incapacitate himself for all the active functions of existence, than Mrs. F.* was rendered incapable of by her deplorable accident. Deprived of the use of her legs, which were distorted as well as her arms and hands, and fixed motionless, and greatly emaciated; she is now able to walk, has regained the form and use of her hands, so far that there can be no doubt of her complete recovery; and the resemblance of the facts of this case to the effects of the superstitious practices of India, gives much of the appearance of accurate historical evidence, to what is related of them. If this is to be credited, it will follow, that the limbs of persons, far beyond the age puberty, may be entirely deprived of all their powers, even that of making the simplest motion, kept in this state for many years, and afterwards restored to the power of performing all their natural functions. It will, of course, be understood, that the limbs which have been so treated, though they do regain their natural powers, must remain deficient in strength to those of men who have never been subjected to the same treatment.

Case LV. is of a similar deformity, though less in degree, and in a young patient. This was indisputably produced by palsy, which disease continued to exercise its influence over the child's legs; they were reduced to their natural form, and supported in their natural position, but acquired no power to direct their own movements. All the benefit that could be obtained in this case was, to enable the patient to walk upon her feet by mechanical assistance

* A lady, by exposing herself imprudently to the vapours of fresh paint, was seized with the painter's cholic, and deprived of the use of her limbs. Her complaint was not understood, and she had been under the influence of the disease for more than two years when I first saw her: she was totally incapable of moving her hands or feet, or doing any thing to help herself. She has been perfectly restored to the use of her feet, and much of the power of using her hands. The case was so far advanced when these papers were put to press, that I intended to introduce a history of it here; but as the patient's state of health, from another cause, has made it necessary to suspend the cure of her hands, I reserve the case for a future publication, and have merely given a general idea of it here.

assistance instead of crawling upon the ground, as she must otherwise have continued to do.

Case LIV is singular, as affording, in the same patient, a proof of the original disease being eradicated as well as the consequent deformity from one leg, and the patient entirely cured: but though the deformity was equally removed from the other leg, some part of the original disease remaining in it, its powers were not restored in the same degree as the former. There is no doubt that the paralytic affection attacked both the legs of this child, and being entirely removed from one, no obstacle was opposed to the perfect cure of that leg; but the other leg is still, in some degree, under the influence of palsy, and therefore its powers are not yet regained, though its form is as perfect as can be required. The time is not yet arrived to form a final judgment upon this case; but as the patient's health is improving in every respect, there is still reason to hope, that she may perfectly regain the use of both her legs.

Case LVI. LVII. and LVIII. are three instances of distortion produced by irregular muscular action, which appears to have been the consequence either of positive deficiency in the medium, whatever that may be, which subjects the muscles to the operation of mind, or of a defect in the nervous system, which prevents volition from directing the muscular action in its natural course. The first was taken at a very early period, and the defect in the legs radically cured. The second was much worse, but was likewise cured, and remained well for a considerable time, but was suffered to relapse, by the very improper conduct of those who had the care of it; was again nearly cured, when it became necessary from peculiar circumstances to relinquish it before it was well; and the third was much worse, and was necessarily given up for a time, on account of the patient's state of health, which was not at all connected with the complaint we are now treating of. The opportunities I had of seeing this child before this particular disease came on, has enabled me to ascertain facts which are of consequence, to enable us to determine the precise nature of the disease, and the method that should be adopted to remove it, with the greatest probability of success.

He was first placed under my care for the cure of varus in the right foot; he was born with this defect, it was completely cured, and did not return. At this time

was

he had been permitted to walk but little, and when his foot was cured, he stooped, and seemed as if he was afraid to walk, a circumstance which I then attributed to his previous situation, but remarked, that although he was four years old, he did not speak intelligibly, and scarcely uttered articulate sounds.

About two years afterwards he was brought to me again; his right foot had then acquired much deformity, which it was intended that I should remove; but illness, the consequence of residence in town, made it necessary to remove him into the country again.

When I saw him the third time, four years from the time of his being first placed under my care, his complaint had assumed a much more serious form; the right foot was greatly distorted, and so rigidly fixed in its distorted state, that it had no capacity for voluntary motion; the left foot was much distorted, but not so much, or so rigidly as the right: at some times his knee appeared to be rigidly fixed in a bent position, at other times they were not so; but, after a very long examination, at various periods, and under a variety of different circumstances, I was enabled to ascertain, that the distortion in both his feet was most positive, and rigidly fixed; that his knees, and every other part of him, were capable of all their natural motion, to the full extent that the limbs of any other person were; but when he was compelled to move, either by being obliged to walk by himself, or by being led by any other person, the morbid affection manifested itself; he seemed to have a dread or horror of motion, and whenever he was compelled to move, he forcibly contracted all the flexor muscles of all his limbs, as if to resist that motion, which he was forced to undergo. On a retrospect, it seems evident, that this disposition manifested itself when he was first under my care, though it did not then excite much attention; but increasing with his years, produced some effect upon the whole system, but most upon the right leg, which was weaker than the rest of his frame, in consequence of the change it had undergone. This had produced great and permanent deformity in that leg, which I effectually removed, as was evident by his being able to use his leg in the natural way, during the time that his attention could be directed to it. This is all that I could effect; the mental or nervous defect is the producing cause, and while that exists in the constitution, the deformity, which is a secondary effect, is liable to return.

From

From all that has been said it may be reasonable to conclude, that when deformity, equal to any of the cases that have been related, exists in patients who have even attained beyond the age of puberty, that deformity may be effectually removed, provided it is the only disease; but when it is secondary to any constitutional disease, the cure of the deformity can be but temporary, unless the disease in the constitution can be eradicated.

THE END.



